



actual size

SKINNER
sub-miniature valves . . .
small in everything
but performance.



**SUB-MINIATURE TWO- AND THREE-WAY
B SERIES NOW AVAILABLE
WITH 1/8" PIPESIZE**

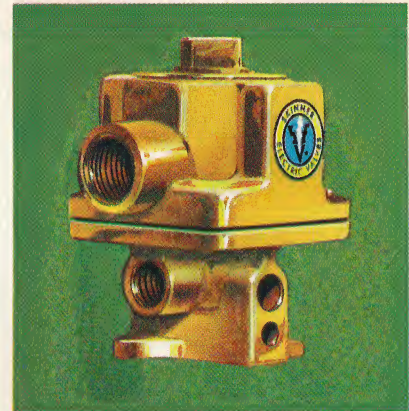
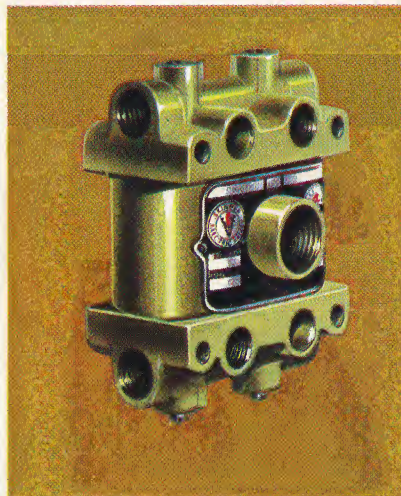
These two- and three-way stainless steel valves give larger valve performance in smaller spaces. Only 1" in diameter and weighing less than 1/3 of a pound, B series valves will operate on pressures up to 400 PSI with relatively large flow. May be used on any application where small size and good flow capacity are required. Current drain is a low 7 watts. Bubbletight and corrosion resistant, they can be used with all common media. Available with single grommet or 1/4" NPT conduit electrical housing with coils for most AC and DC voltages. Available with the new 1/8" PTF pipesize or 1/16" PTF pipesize and fittings to adapt from 1/16" PTF to 1/8" flared tubing. Available normally open, normally closed, directional control and multi-purpose.

**There is extra quality and
long trouble-free life
built into every SKINNER valve.**

Quality and reliability have become synonymous with Skinner valves. Skinner valves operate everywhere from outer space to miles under the earth in oil lines. If you have a control problem, call in your Skinner distributor. He is a hydraulics and pneumatics specialist equipped to give you professional engineering service. Skinner distributors maintain stocks to provide you with the exact valve you require. For additional information, contact your nearest Skinner distributor. (He's listed in the Yellow Pages.) Or write to us at the address below.

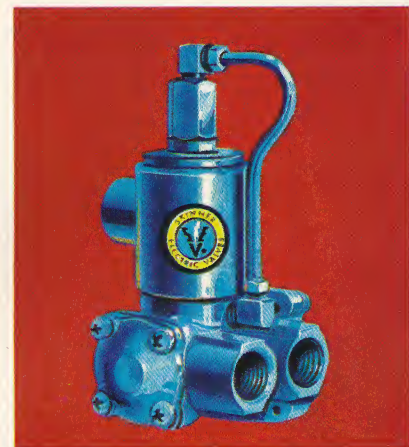
FOUR-WAY, ALL-PURPOSE V9 SERIES

These four-way valves are small, compact, and are actually two three-way valves in one. They save on installation space, cut initial cost and reduce maintenance. Used for the operation of single- and double-acting air and hydraulic cylinders, and for actuating large pilot-operated valves. Body is die-cast zinc with sodium chromate finish. Available normally closed—normally closed, normally open—normally open, and normally closed—normally open. Maximum pressures up to 225 PSI.



THREE-WAY DIRECT ACTING "A" SERIES

The three-way "A" series is designed to bridge the gap between the three-way V5 series and the L series. The valves are die-cast zinc and have only two moving parts. Internal parts are stainless steel to resist corrosion. Used to give economical and efficient operation to medium size cylinders and to provide large flow at pressures up to 275 PSI. Also for garage door mechanisms and numerous industrial applications. An "A" series solenoid operator (partial valve) is available to pilot-operate larger valves. Available normally open, normally closed, directional control and multi-purpose.



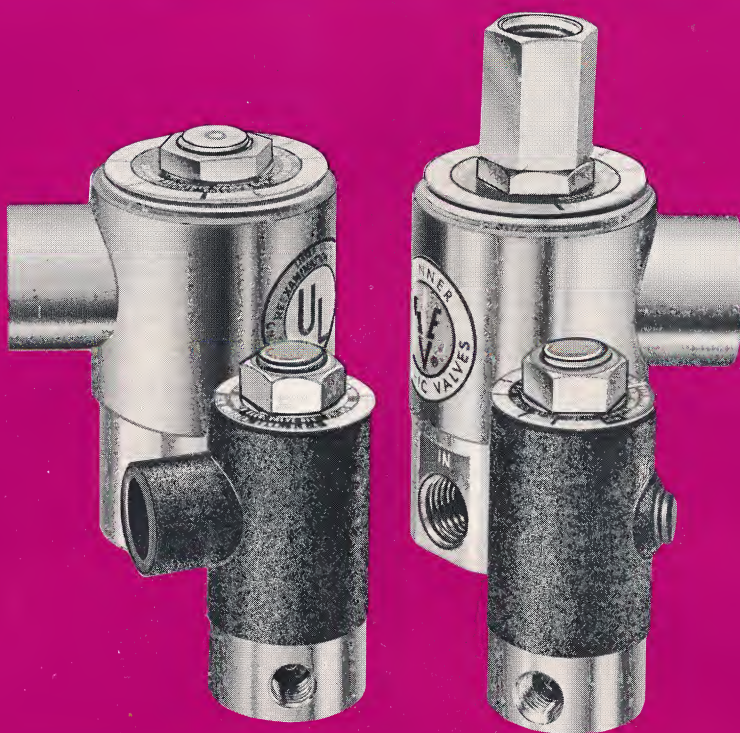
**THREE-WAY, PILOT-OPERATED,
HIGH-FLOW L—XL SERIES**

These, the largest of Skinner three-way valves, are diaphragm pilot-operated using an integral V5 or X5 type operator. They control hydraulic and pneumatic cylinders and are used in a variety of industrial and commercial applications. They provide bubbletight operation, are low in initial cost and give long, trouble-free life. Forged naval brass body with stainless steel solenoid pilot operator. Available normally open, normally closed and directional control in standard or explosion-proof construction. Pressures from 5 to 200 PSI.



SKINNER **ELECTRIC VALVES**

Skinner Sub-Miniature Two-Way Solenoid Valves, B Series



B series shown actual size compared with two-way V5 Series Valves

Sub-miniature stainless steel valves are tiny in size, big in flow capacity

New Skinner B Series sub-miniature solenoid valves are truly miniature—in over-all size, pipe size, and weight. For the first time, they permit designers of pneumatic and hydraulic control systems to specify really miniature solenoid valves from stock.

B Series valves are only one inch in diameter, and just over two inches high. Valves are available with $\frac{1}{8}$ " PTF or $\frac{1}{16}$ " PTF. When $\frac{1}{16}$ " PTF valves are ordered SAE 45° flare fittings are supplied. $\frac{1}{16}$ " PTF to $\frac{1}{8}$ " OD Tubing. For threading $\frac{1}{16}$ " PTF for these ports, $\frac{5}{16}$ " tubing has the proper O.D. Conduit models have $\frac{1}{4}$ " NPT conduit electrical connection.

B Series sub-miniature valves are available two-way normally open Type B1 and two-way normally closed Type B2 in standard construction only.

Each valve is 100% tested to specifications similar to those in the aircraft and missile industries. Skinner uses the highest standards of the Underwriters' Laboratories as minimum operating specifications.

APPLICATIONS

- Machine Tools
- Automation
- Instrumentation
- Oil burners
- Vending machines
- Welding equipment
- Lubricating devices
- Air horns
- Humidifiers
- Spraying equipment
- Dental equipment
- Aircraft
- Transportation
- Portable equipment
- Water treatment equipment

SPECIFICATIONS

VALVE TYPES

Normally open type B1

Normally closed type B2

ORIFICE DIAMETER

Normally open

Type B1 — $\frac{1}{32}$ ", $\frac{3}{64}$ "

Normally closed

Type B2 — $\frac{1}{32}$ ", $\frac{3}{64}$ ", $\frac{1}{16}$ ", $\frac{1}{8}$ "

FLOW RATE—Refer to C_v factor in Catalog listings and flow charts in Section 1.

C_v FACTOR—Refer to Catalog listings.

PIPE SIZE— $\frac{1}{8}$ " PTF and $\frac{1}{16}$ " PTF (short dryseal thread) No. 10-32 fluid connectors also available. Fittings included to adapt from $\frac{1}{16}$ " PTF to $\frac{1}{8}$ " flared tubing.

SPECIFICATIONS (Continued)

VOLTAGE—Most AC and DC voltages and frequencies including voltage ranges and frequencies used overseas. Refer to coil listings, Section 13.

RESPONSE TIME—AC 4 to 8 milliseconds to open or close; DC 10 to 15 milliseconds to open, 6 to 12 milliseconds to close.

OPERATING SPEED—Up to 600 cycles per minute.

CURRENT DRAIN—Refer to table in Section 13.

POWER CONSUMPTION—7 watts.

HEAT RISE—185° F (85° C) maximum for continuous duty.

MAXIMUM OPERATING PRESSURE DIFFERENTIAL

—Up to 400 PSI, see Catalog listings.

VACUUM—Down to 5 microns.

PROOF PRESSURE—1½ times maximum operating pressure differential.

BURST PRESSURE—10,000 PSIG.

MEDIA—All common media including air, inert gases, hydraulic fluids, petroleum products, freons, water, steam and many corrosive media. Note: Use with steam, and some petroleum products normally requires plunger assembly insert modification. Refer to Section 1.

FILTRATION—None required.

LUBRICATION—None required. Note: Air line lubrication will substantially increase valve life on high-cycle air applications.

INTERNAL LEAKAGE—None.

EXTERNAL LEAKAGE—None.

TEMPERATURE RANGE—Minus 40° F (–40° C) to Plus 180° F (+82.2° C)

LIFE EXPECTANCY—Millions of cycles.

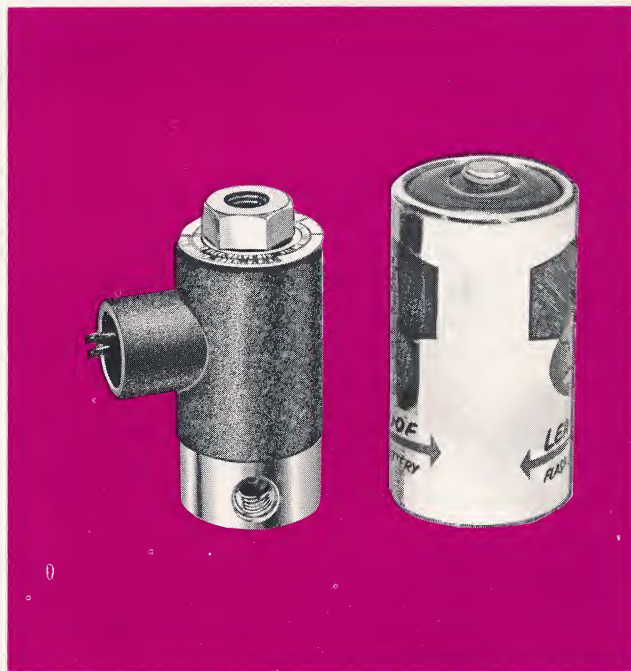
VIBRATION AND SHOCK—10 G's and above.

APPROVAL—Consult Skinner for information.

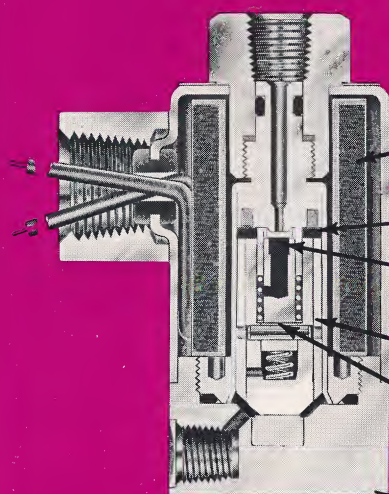
TWO-WAY NORMALLY OPEN SUB-MINIATURE VALVES, Type B1

Two-way normally open valves are available in standard construction only. They are direct acting and all internal parts as well as the valve body are stainless steel.

An ingenious internal spring and cross-slotted bushing unit in conjunction with the plunger and seat assembly assure bubbletight sealing. This is a type of floating top seal construction. Refer to Section 1 for details of floating top seals.



FEATURES



Coil housing simplifies installation—can be rotated 360°. Steel housing with black protective finish has 1/4" NPT conduit. Other types available. Refer to Section 13.

Coils for most voltages and frequencies—wide choice with low wattage consumption. Refer to Section 13.

Copper shading ring—used in AC voltages only. Refer to Section 1 for details.

Orifice does not cut insert—highly finished, well-rounded surface provides long insert life.

Sleeve assembly, precision welded—made of 303 and 430 F stainless steel. Over 10,000 PSI burst strength.

Stainless steel floating top seal—has molded soft synthetic Buna-N insert for bubbletight sealing.

Stainless steel body—resists contamination.

PRINCIPLES OF OPERATION

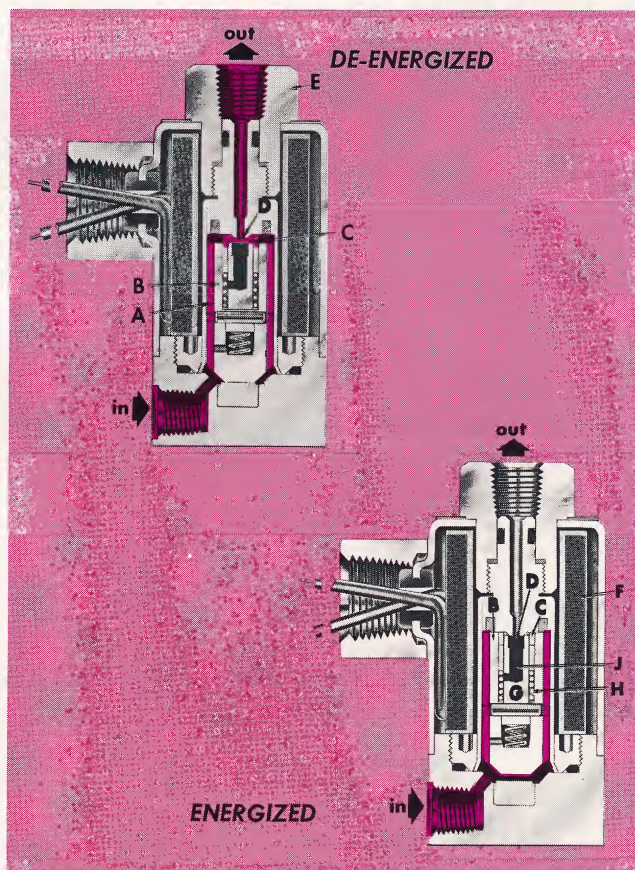
Two-way Normally Open Sub-Miniature Valves, Type B1

DE-ENERGIZED

When the two-way normally open valve is de-energized fluid flow is from the IN port, located in the body, up through the sleeve, A, around the plunger, B, through the cross-slotted bushing, C, and through the orifice, D, located in the sleeve, and through the sleeve adapter, E, to the OUT port.

ENERGIZED



When current is applied to the coil, F, a magnetic field is established that moves the plunger assembly, B, upward. The force causes the cross-slotted bushing, C, to retract into the plunger. The upper seal assembly (floating top seal), G, moving with the plunger within the bushing, is forced against the orifice, D. The plunger spring, H, provides sufficient force on the floating top seal so that the soft synthetic insert, J, seals orifice, D, stopping flow through the valve.



CATALOG LISTINGS

For ordering information see Section 1. Note: Bold type and color indicate valves carried in factory stock.

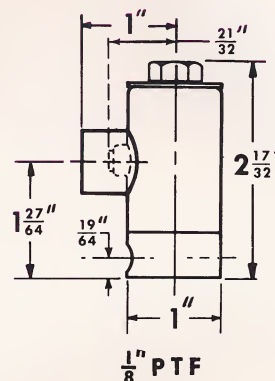
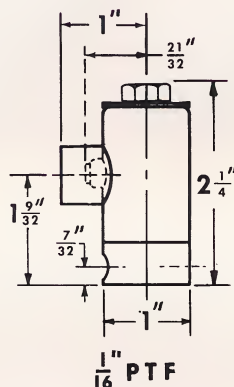
TWO-WAY NORMALLY OPEN SUB-MINIATURE VALVES, Type B1

*maximum operating pressure differential AC & DC	orifice diameter (inch)	C _v factor	CATALOG NUMBER				**weight oz.
			option ES		option EC		
							
			grommet		1/4" NPT conduit		
			pipe size***		pipe size***		
			1/16" PTF	1/8" PTF	1/16" PTF	1/8" PTF	
400	1/32	.019	B1 DA9 400	B1 DA1 400	B1 DB9 400	B1 DB1 400	5
200	3/64	.045	B1 DA9 200	B1 DA1 200	B1 DB9 200	B1 DB1 200	5

* Higher than standard pressure ratings available. Please consult Skinner.

** Weight shown for valve with Option ES. Add 1/4 oz. for Option EC.

*** PTF (short dryseal thread).



TWO-WAY NORMALLY CLOSED SUB-MINIATURE VALVES, Type B2

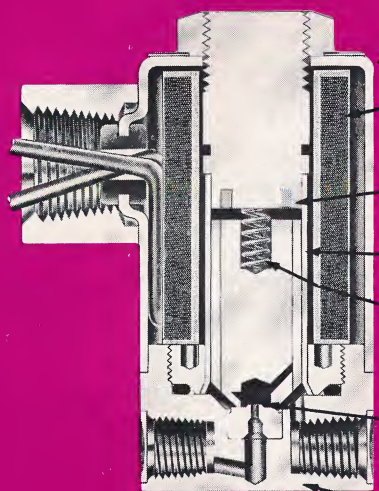
Two-way normally closed valves are direct acting and have only two moving parts, a stainless steel spring and a stainless steel plunger.

Coils for most voltages and frequencies are available in molded waterproof construction as well as standard varnish-impregnated. For details, refer to Section 13.

Valves can be installed in any position, and are easy to inspect without removing from the line.



FEATURES



Coil housing simplifies installation—can be rotated 360°. Steel housing with black protective finish has 1/4" NPT conduit. Other types available. Refer to Section 13.

Coils for most voltages and frequencies—wide choice with low wattage consumption. Refer to Section 13.

Copper shading ring—used in AC voltages only. Refer to Section 1 for details.

Sleeve assembly precision welded—made of 303 and 430 F stainless steel. Over 10,000 PSI burst strength.

Stainless steel plunger spring—provides positive plunger return regardless of mounting position.

Orifice does not cut insert—highly finished, well-rounded surface provides long insert life.

Stainless steel body—resists contamination.

PRINCIPLES OF OPERATION

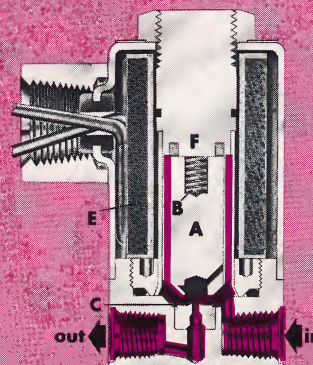
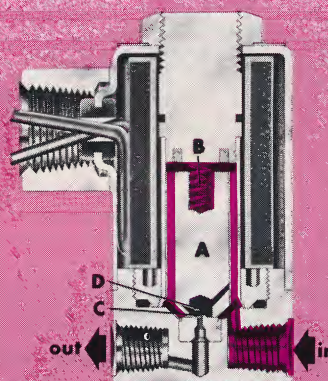
Two-Way Normally Closed Sub-Miniature Valves, Type B2

DE-ENERGIZED

When the two-way normally closed valve is de-energized fluid enters the IN port, flows up around the plunger, A, spring, B, and to the orifice, C. The soft synthetic insert, D, in the plunger is held against the orifice, C, by the spring, B, and fluid pressure, preventing flow through the orifice to the OUT port.

ENERGIZED



When the coil, E, is energized the resulting magnetic field overcomes the force of the fluid pressure and spring, B, and causes the plunger, A, to move upward into face-to-face contact with the stop, F. This upward movement opens the orifice, C, permitting fluid flow from the IN port, through the orifice and through the OUT port.



CATALOG LISTINGS For ordering information see Section 1.

Note: Bold type and color indicate valves carried in factory stock. Catalog numbers followed by a (†) indicate valves stocked nationwide by Skinner Stocking Distributors.

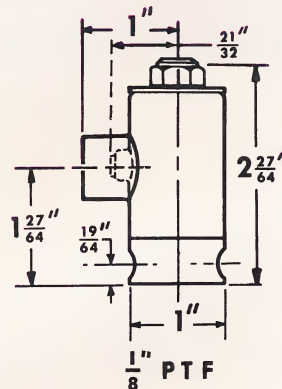
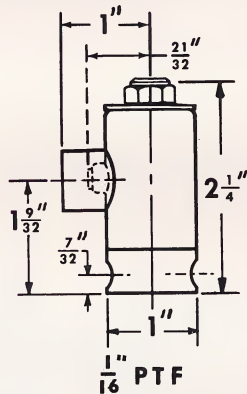
TWO-WAY NORMALLY CLOSED SUB-MINIATURE VALVES, Type B2

*maximum operating pressure differential		orifice diameter (inch)	C _v factor	CATALOG NUMBER				**weight oz.
				option ES		option EC		
								
				grommet		1/4" NPT conduit		
				pipe size***		pipe size***		
AC	DC			1/16" PTF	1/8" PTF	1/16" PTF	1/8" PTF	
400	400	1/32	.019	B2 DA9 400	B2 DA1 400	B2 DB9 400	B2 DB1 400	5
250	250	3/64	.045	B2 DA9 250	B2 DA1 250	B2 DB9 250	B2 DB1 250	5
175	175	1/16	.065	B2 DA9 175†	B2 DA1 175	B2 DB9 175	B2 DB1 175	5
50	—	1/8	.240	B2 DA9 052	B2 DA1 052	B2 DB9 052	B2 DB1 052	5
—	25	1/8	.240	B2 DA9 026	B2 DA1 026	B2 DB9 026	B2 DB1 026	5

* Higher than standard pressure ratings available. Please consult Skinner.

** Weight shown for valve with Option ES. Add 1/4 oz. for Option EC.

*** PTF (short dryseal thread).



OPTIONS

Skinner Types B1 and B2 sub-miniature valves are available with several housing, mounting and coil options. Should you require a specific option not shown, please contact Skinner.

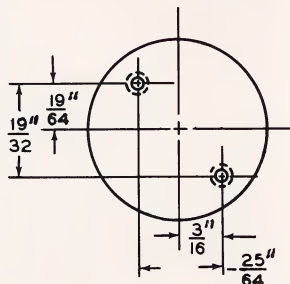
ELECTRICAL HOUSING AND COIL OPTIONS

For description of electrical housings available and listings of coils available for sub-miniature valves, please refer to Section 13.

MOUNTING OPTIONS

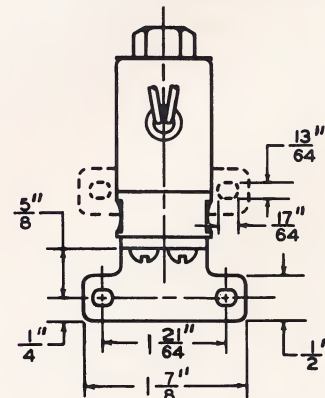
Mounting holes—Standard GS

The standard mounting supplied on all B Series valves are two 8-32 tapped holes spaced as shown.



UNIVERSAL MOUNTING BRACKET

A universal mounting bracket is available to mount the valve in either of the two positions shown. Predrilled holes in the bracket permit attachment to the valve by means of the tapped holes in the base and to the mounting surface.



SKINNER ELECTRIC VALVE DIVISION, NEW BRITAIN, CONN., U.S.A.

SPECIFICATION FORM 103

Please fill in all parts of this form. If data for a part is unknown, mark "unknown".

This completed form will enable us to recommend the most appropriate and economical valve for your application.



Customer Name Date

Address

Individual Title

Application ☐ O.E.M. ☐ User

Estimated Quantity Now Yearly If high quantity (5000 or more) estimate price expected \$ Ea. net.

GENERAL SPECIFICATIONS

☐ Explosionproof construction, UL Class I Group D, Class II Groups F and G.

VALVE TYPE

- ☐ Two way
☐ Three way
 ☐ Quick exhaust
☐ Four way

DE-ENERGIZED POSITION

- ☐ ☐ Normally open
☐ ☐ Normally closed
 ☐ Directional control
 ☐ Multi-purpose

ELECTRICAL OUTLET

- ☐ 1/2" NPT conduit (EC)
☐ 1/4" NPT conduit
☐ Grommet (ES)
☐ Other

FLUID CONNECTION

- ☐ 1/16" NPT ☐ 1/2" NPT
☐ 1/8" NPT ☐ 3/4" NPT
☐ 1/4" NPT ☐ 1" NPT
☐ 3/8" NPT ☐ Other

Catalog option features (if required)

VOLTAGE

- ☐ AC Max. Min.
 Cycles
☐ DC Max. Min.

DUTY CYCLE

- ☐ Continuous duty; energized for more than one hour.
 Time energized hours. Time de-energized hours
☐ Intermittent duty; energized for less than one hour.
 Max. time energized minutes. Min. time de-energized minutes.

ORIFICE DIAMETER

Inlet or C_v
Exhaust or C_v

CYCLING DATA

Operating speed CPM

LIFE EXPECTANCY

Total cycles per year
Number of years

FLOW RATE

Gases: SCFM when inlet pressure
 is PSIG and outlet pressure is PSIG
Liquids: GPM when inlet pressure
 is PSIG and outlet pressure is PSIG

AMBIENT CONDITIONS

- ☐ Temperature °F Max. Min.
☐ High humidity and condensation
☐ Other

GAUGE PRESSURE OR VACUUM

Maximum static pressure PSIG
Maximum vacuum inches of Hg
Maximum operating pressure differential PSI
Maximum back pressure PSIG
Minimum operating pressure differential PSI

ALLOWABLE INTERNAL LEAKAGE

☐ None ☐ cc/minute at PSID

VIBRATION AND SHOCK

- ☐ Not a factor
☐ Vibration CPS at G's
☐ Shock G's duration for milliseconds
 in ☐ Vertical plane ☐ Horizontal plane

MEDIA BEING HANDLED

Description
If gas ☐ Lubricated
 ☐ Non lubricated
Temperature °F Max. Min.
Viscosity
 (if over No. 10 SAE oil or 100 SSU at 100°F)

APPROVAL REQUIRED

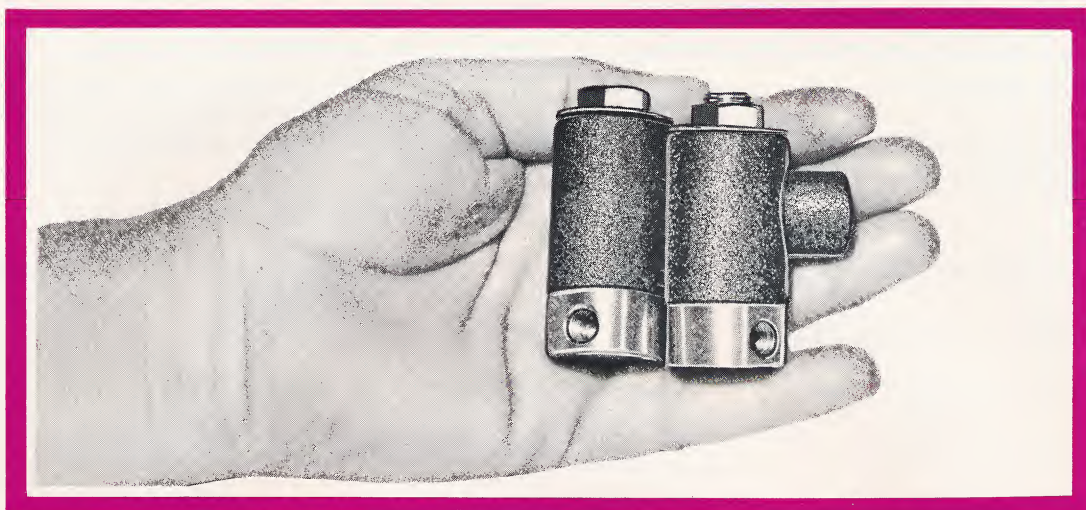
- ☐ None ☐ Gov't source inspection
☐ UL approval ☐ UL component approval
☐ Other (CSA, FM, etc.)
☐ See other side for diagram or remarks

Form completed by: Name Company

Skinner's recommendation: Valve number or description

Name Date

Skinner Sub-Miniature Three-Way Solenoid Valves—B Series



Available normally open, normally closed, directional control and multipurpose with big flow capacities

New Skinner B Series sub-miniature solenoid valves are truly miniature—in over-all size, pipe size, and weight. For the first time, they permit designers of pneumatic and hydraulic control systems to specify really miniature solenoid valves from stock.

B Series valves are only one inch in diameter, and just over two inches high. Valves are available with $\frac{1}{8}$ " PTF or $\frac{1}{16}$ " PTF. When $\frac{1}{16}$ " PTF valves are ordered SAE 45° flare fittings are supplied. $\frac{1}{16}$ " PTF to $\frac{1}{8}$ " OD Tubing. For threading $\frac{1}{16}$ " PTF for these ports, $\frac{5}{16}$ " tubing has the proper O.D. Conduit models have $\frac{1}{4}$ " NPT conduit electrical connection.

Each valve is 100% tested to specifications similar to those in the aircraft and missile industries. Skinner uses the highest standards of the Underwriters' Laboratories as minimum operating specifications.

B Series sub-miniature valves are available three-way normally open, Type B5, three-way normally closed, Type B3, three-way directional control, Type B6, and three-way multipurpose, Type B4. All types are furnished in Standard Construction only.

Directional control valves have Inlet pressure open to one port when de-energized and to a second port when energized.

Multipurpose valves are designed to accept Inlet pressure or vacuum at any port. Then can also be used as two-way normally open or normally closed by plugging one port, or as three-way normally open, normally closed or directional control.

APPLICATIONS

- Air and Hydraulic Cylinders
- Machine Tools
- Automation
- Instrumentation
- Oil burners
- Vending machines
- Welding equipment
- Lubricating devices
- Air horns
- Humidifiers
- Spraying equipment
- Dental equipment
- Aircraft
- Transportation
- Portable equipment
- Water treatment equipment

SPECIFICATIONS

VALVE TYPES

Normally open type B5
Normally closed type B3
Normally closed, exhaust to atmosphere, type B3A
Directional Control, type B6
Multipurpose, type B4

ORIFICE DIAMETER

See Catalog Listings

FLOW RATE—Refer to C_v factor in Catalog listings and flow charts in Section 1.

C_v FACTOR—Refer to Catalog listings.

PIPE SIZE— $\frac{1}{8}$ " PTF and $\frac{1}{16}$ " PTF (short dryseal thread) No. 10-32 fluid connectors also available. Fittings included to adapt from $\frac{1}{16}$ " PTF to $\frac{1}{8}$ " flared tubing.

SPECIFICATIONS

VOLTAGE—Most AC and DC voltages and frequencies including voltage ranges and frequencies used overseas. Refer to coil listings, Section 13.

RESPONSE TIME—AC 4 to 8 milliseconds to open or close; DC 10 to 15 milliseconds to open, 6 to 12 milliseconds to close.

OPERATING SPEED—Up to 600 cycles per minute.

CURRENT DRAIN—Refer to table in Section 13.

POWER CONSUMPTION—7 watts.

HEAT RISE—185° F (85° C) maximum for continuous duty.

MAXIMUM OPERATING PRESSURE DIFFERENTIAL
—Up to 250 PSI, see Catalog listings.

VACUUM—Down to 5 microns.

PROOF PRESSURE—1½ times maximum operating pressure differential.

BURST PRESSURE—10,000 PSIG.

MEDIA—All common media including air, inert gases, hydraulic fluids, petroleum products, freons, water, steam and many corrosive media. Note: Use with steam, and some petroleum products normally requires plunger assembly insert modification. Refer to Section 1.

FILTRATION—None required.

LUBRICATION—None required. Note: Air line lubrication will substantially increase valve life on high-cycle air applications.

INTERNAL LEAKAGE—None.

EXTERNAL LEAKAGE—None

TEMPERATURE RANGE—Minus 40° F (–40° C) to Plus 180° F (+82.2° C)

LIFE EXPECTANCY—Millions of cycles.

VIBRATION AND SHOCK—10 G's and above.

APPROVAL—Consult Skinner for information.

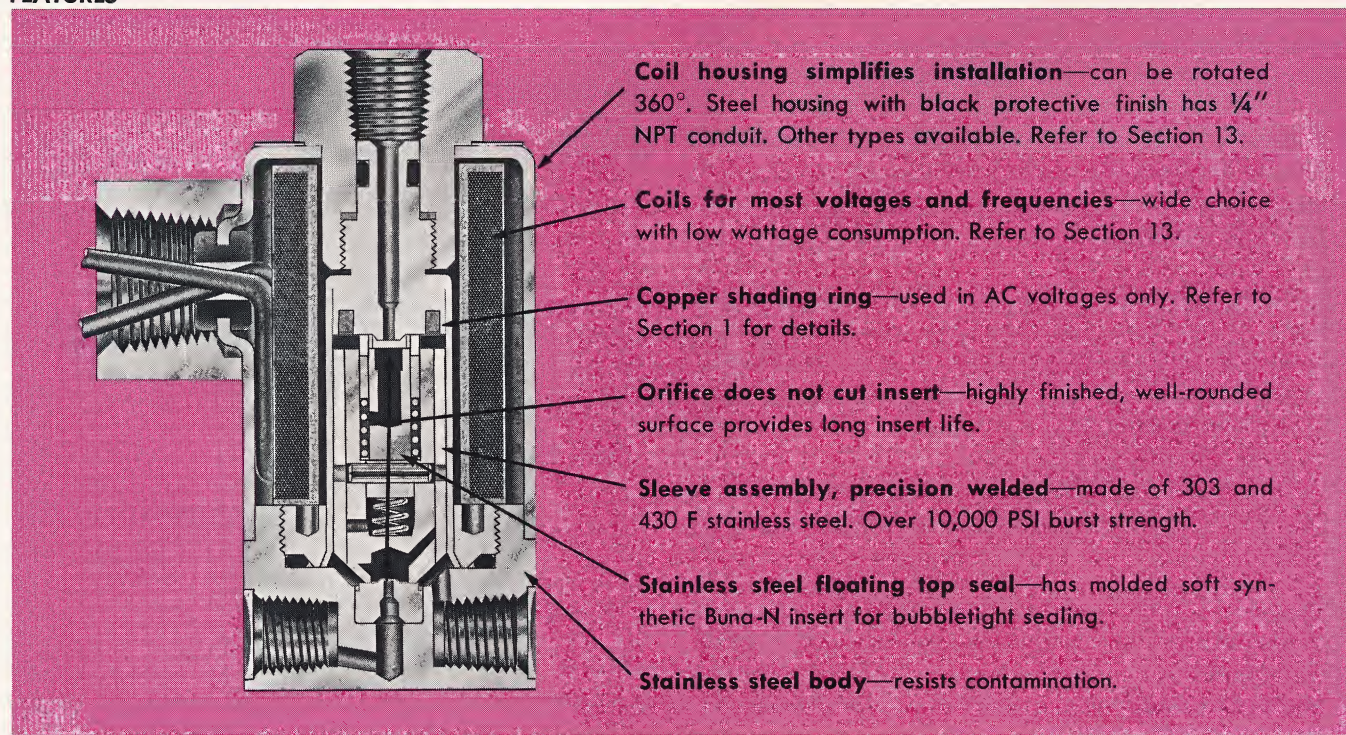
THREE-WAY NORMALLY OPEN SUB-MINIATURE VALVES, Type B5

DETAILED DESCRIPTION

The three-way B Series valves are direct acting. An internal spring and cross-slotted bushing unit within the plunger permits spring-loaded operation within the B Series minia-

ture diameter. With this arrangement there are five moving parts, all stainless steel—two springs, cross-slotted bushing, the upper seal assembly and the plunger. There are no sliding seals or packing to cause leakage, and all models are bubble-tight.

FEATURES



PRINCIPLES OF OPERATION

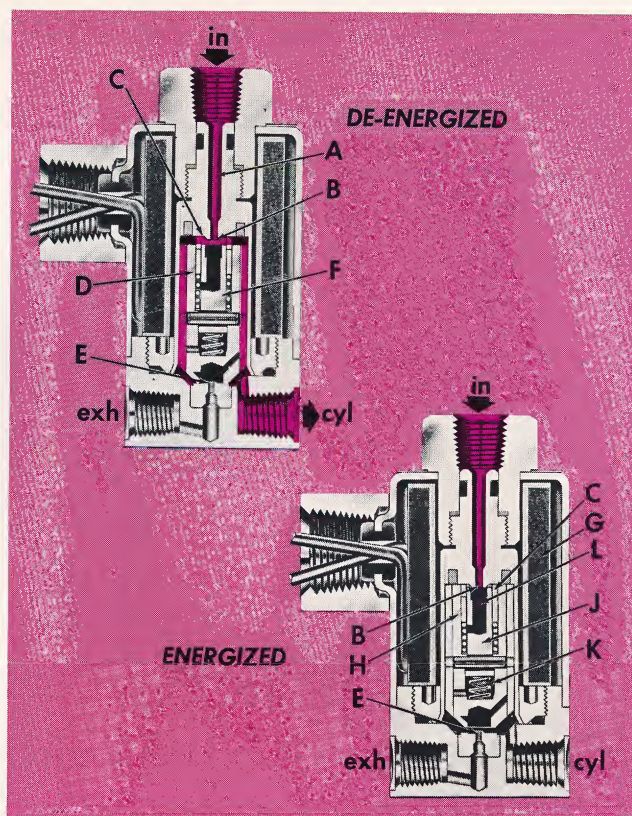
Three-Way Normally Open Sub-Miniature Valves, Type B5

DE-ENERGIZED

When the three-way normally open valve is de-energized, fluid is admitted through the In port, through the Sleeve, A, through the sleeve orifice, B, through the cross-slotted bushing, C, through grooves in the plunger, D, and then out the cylinder port. The exhaust port is sealed off at the body orifice, E, by the force of the plunger spring, F.

ENERGIZED

When current is applied to the coil, G, a magnetic field is established that moves the plunger, H, upward, opening the cylinder port to the exhaust port through the body orifice, E. The cross-slotted bushing, C, retracts into the plunger, and the floating top seal J, rises with the plunger, within the cross-slotted bushing, sealing the sleeve orifice, B. The upper seal assembly spring, K, causes the soft synthetic insert, L, in the upper seal assembly, to seal orifice, B.





CATALOG LISTINGS

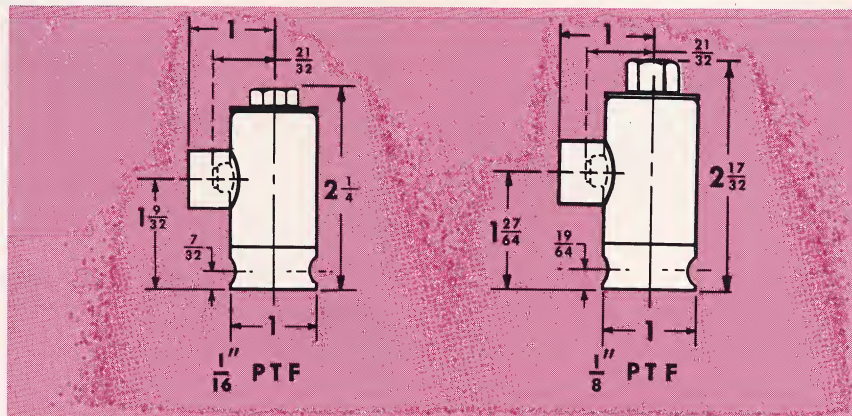
For ordering information see Section 1.

Note: Bold type and color indicate valves carried in factory stock.

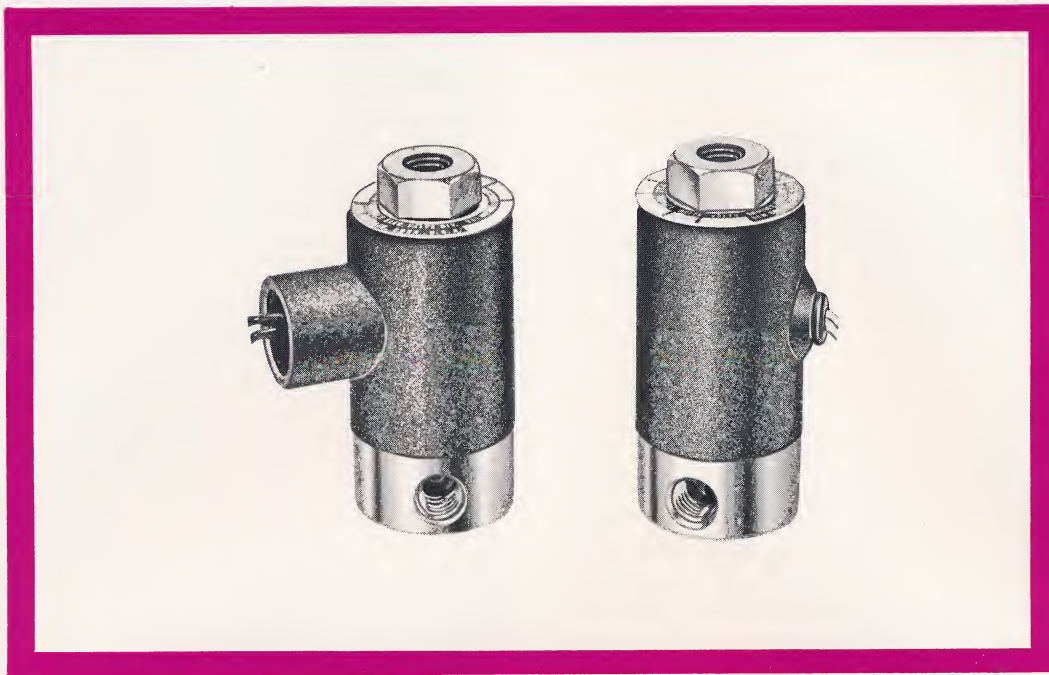
THREE-WAY NORMALLY OPEN SUB-MINIATURE VALVES, Type B5

maximum operating pressure differential (AC or DC)	orifice dia. (inch)	inlet port	C _v factor	exhaust port	C _v factor	catalog number				*weight oz.
						option ES		option EC		
										
						grommet		1/4" NPT conduit		
						pipe size		pipe size		
1/16" PTF		1/8" PTF		1/16" PTF		1/8" PTF				
200	1/32	.019	1/32	.019	B5 DA9 200	B5 DA1 200	B5 DB9 200	B5 DB1 200	5	
150	3/64	.045	3/64	.045	B5DA9150	B5 DA1 150	B5 DB9 150	B5 DB1 150	5	
125	1/16	.065	3/64	.045	B5 DA9 125	B5 DA1 125	B5 DB9 125	B5 DB1 125	5	

*ADD 1/4 OZ. FOR OPTION EC



Three-Way Normally Closed Sub-Miniature Valves, Type B3



PRINCIPLES OF OPERATION

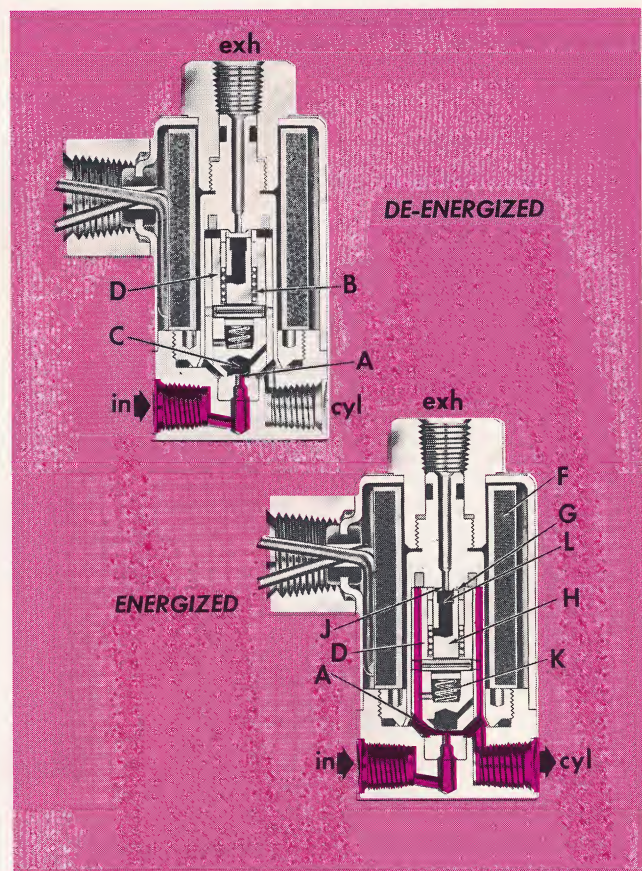
Three-Way Normally Closed Sub-Miniature Valves, Type B3

DE-ENERGIZED

When the three-way normally closed valve is de-energized, fluid is admitted through the In port to orifice, A, and is sealed off by the force of the plunger spring, B, and the bottom insert, C, in the plunger; D. The cylinder port is open to the exhaust port.

ENERGIZED

When current is applied to the coil, F, a magnetic field is established that moves the plunger, D, upward, opening the Inlet orifice, A, to the cylinder port. The cage, G, retracts into the plunger. The upper seal assembly, H, rises with the plunger, within the cage, sealing the sleeve orifice, J. The upper seal assembly spring, K, causes the soft synthetic insert, L, to seal the sleeve orifice.





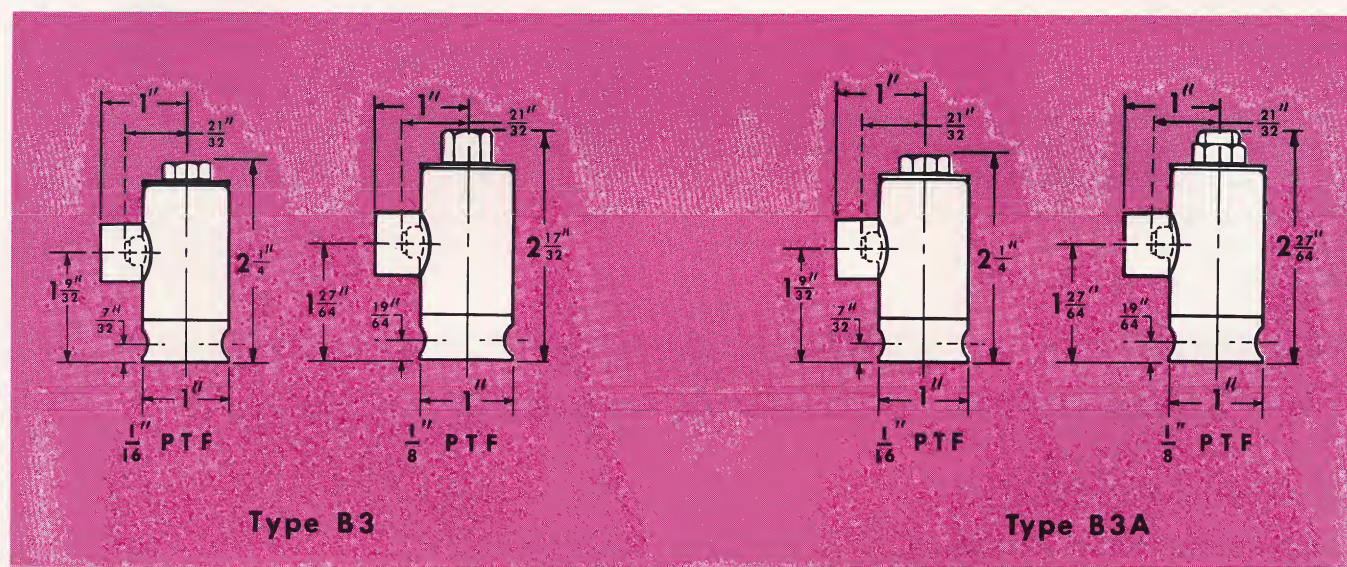
CATALOG LISTINGS For ordering information see Section 1.

Note: Bold type and color indicate valves carried in factory stock. Catalog numbers followed by a dagger (†) indicate valves stocked nationwide by Skinner Stocking Distributors.

THREE-WAY NORMALLY CLOSED SUB-MINIATURE VALVES, Type B3

Note: For applications requiring exhaust to atmosphere on air operation, models are furnished without an exhaust adapter. These valves are referred to as Type B3A. Use table below for ordering.



maximum operating pressure differential (AC or DC)	orifice dia. (inch)	inlet port	C _v factor	exhaust port	C _v factor	catalog number				*weight oz.
						option ES		option EC		
										
						grommet		1/4" NPT conduit		
						pipe size		pipe size		
						1/16" PTF	1/8" PTF	1/16" PTF	1/8" PTF	
200	1/32		.019	1/32	.019	B3 DA9 200	B3 DA1 200	B3 DB9200	B3 DB1 200	5
150	3/64		.045	3/64	.045	B3DA9150†	B3 DA1 150	B3DB9150	B3 DB1 150	5
100	1/16		.065	3/64	.045	B3 DA9 100	B3 DA1 100	B3 DA9 100	B3 DB1 100	5



Type B3

Type B3A

THREE-WAY NORMALLY CLOSED SUB-MINIATURE VALVES, EXHAUST TO ATMOSPHERE, Type B3A

maximum operating pressure differential (AC or DC)	orifice dia. (inch)	inlet port	C _v factor	exhaust port	C _v factor	catalog number				*weight oz.
						option ES		option EC		
										
						grommet		1/4" NPT conduit		
						pipe size		pipe size		
						1/16" PTF	1/8" PTF	1/16" PTF	1/8" PTF	
200	1/32	.019	1/32	.019	B3ADA9200	B3ADA1200	B3ADB9200	B3ADB1200	5	
150	3/64	.045	3/64	.045	B3ADA9150	B3ADA1150	B3ADB9150	B3ADB1150	5	
100	1/16	.065	3/64	.045	B3ADA9100	B3ADA1100	B3ADB9100	B3ADB1100	5	

*ADD 1/4 OZ. FOR OPTION EC

Three-Way Directional Control Sub-Miniature Valves, Type B6

Directional control valves are so designed that the Inlet pressure is open to one port when the valve is de-energized, and to a second port when the valve is energized.

Type B6 valves have all the features of Types B3 and B5, and are identical in size.

PRINCIPLES OF OPERATION

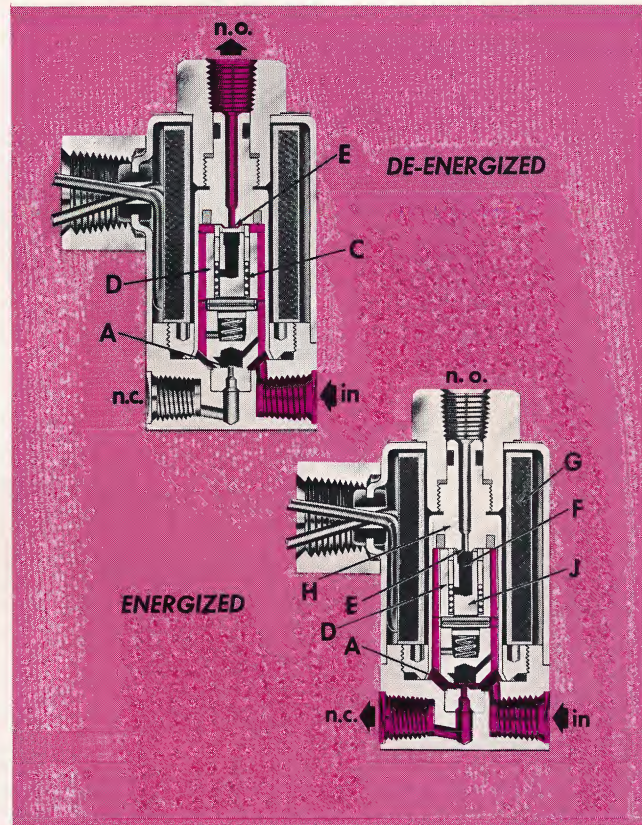
Three-Way Directional Control Valves, Type B6

DE-ENERGIZED

When the three-way directional control valve is de-energized, fluid enters the In port, flows up and around the plunger, D, through sleeve orifice, E, and out the normally open (N.O.) port. The orifice, A, is sealed by the soft synthetic insert in the plunger and the force of the plunger return spring, C. As a result, there is no flow to the normally closed (N.C.) port.

ENERGIZED

When current is applied to the coil, G, a magnetic field is established that moves the plunger, D, upward against the stop, H. The soft synthetic insert, F, located in the top of the plunger, seals the sleeve orifice, E. Orifice, A, is opened permitting fluid to flow from the In port through body orifice, A, to the normally closed (N.C.) port.





THREE-WAY DIRECTIONAL CONTROL SUB-MINIATURE VALVES, Type B6

CATALOG LISTINGS

For ordering information see Section 1.

Note: Bold type and color indicate valves carried in factory stock.

maximum operating pressure differential (AC or DC)	orifice dia. (inch)	normally closed port	C _v factor	orifice dia. (inch)	normally open port	C _v factor	catalog number				*weight oz.
							option ES		option EC		
											
							grommet		1/4" NPT conduit		
							pipe size		pipe size		
							1/16" PTF	1/8" PTF	1/16" PTF	1/8" PTF	
250	1/32		.019	1/32		.019	B6 DA9 250	B6 DA1 250	B6 DB9 250	B6 DB1 250	5
200	3/64		.045	3/64		.045	B6 DA9 200	B6 DA1 200	B6 DB9 200	B6 DB1 200	5
175	1/16		.065	3/64		.045	B6 DA9 175	B6 DA1 175	B6 DB9 175	B6 DB1 175	5

*ADD 1/4 OZ. FOR OPTION EC

Three-Way Multipurpose Sub-Miniature Valves, Type B4

Multipurpose valves are designed for all-purpose applications in that they can be three-way normally open, three-way normally closed, or three-way directional control. They can also be used as two-way normally open, two-way normally closed, or dual purpose by plugging one port. Fluid pressure or vacuum can be applied at any port. These valves can also control two independent Inlet pressures.

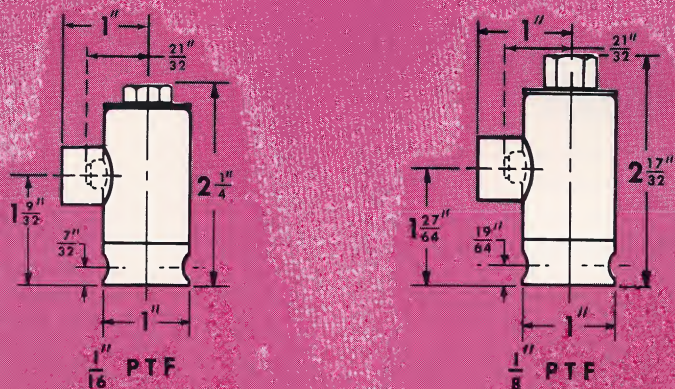
Ports are stamped COM. for common, NO for normally open, and NC for normally closed.

For principles of operation, refer to Types B5, B3 and B6. Operation will correspond to the type of hookup selected.

CATALOG LISTINGS



For ordering information see Section 1.

Note: Bold type and color indicate valves carried in factory stock.



Type B4, Type B6

THREE-WAY MULTIPURPOSE VALVES, Type B4

maximum operating pressure differential (AC or DC)	orifice dia. (inch)	C _v factor	orifice dia. (inch)	C _v factor	catalog number				*weight oz.
					option ES		option EC		
									
					grommet		1/4" NPT conduit		
					pipe size		pipe size		
					1/16" PTF	1/8" PTF	1/16" PTF	1/8" PTF	
150	1/32	.019	1/32	.019	B4DA9150	B4 DA1 150	B4 DB9 150	B4 DB1 150	5
100	3/64	.045	3/64	.045	B4 DA9 100	B4 DA1 100	B4 DB9 100	B4 DB1 100	5
75	1/16	.065	3/64	.045	B4 DA9 075	B4 DA 075	B4 DB9 075	B4 DB1 075	5

*ADD 1/4 OZ. FOR OPTION EC

OPTIONS

Skinner three-way sub-miniature valves are available with several housing, mounting and coil options. Should you require a specific option not shown, please contact Skinner.

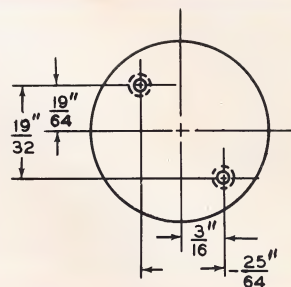
ELECTRICAL HOUSING AND COIL OPTIONS

For description of electrical housings and coils available for sub-miniature valves, please refer to Section 13.

MOUNTING OPTIONS

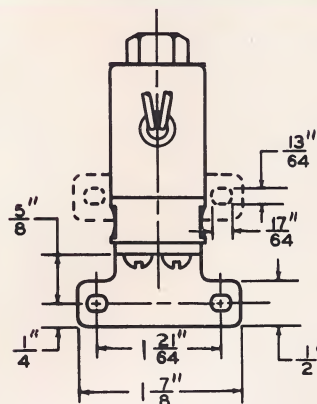
Mounting holes—Standard GS

The standard mounting supplied on all B Series valves are two 8-32 tapped holes spaced as shown.



UNIVERSAL MOUNTING BRACKET

A universal mounting bracket is available to mount the valve in either of the two positions shown. Predrilled holes in the bracket permit attachment to the valve by means of the tapped holes in the base and to the mounting surface.



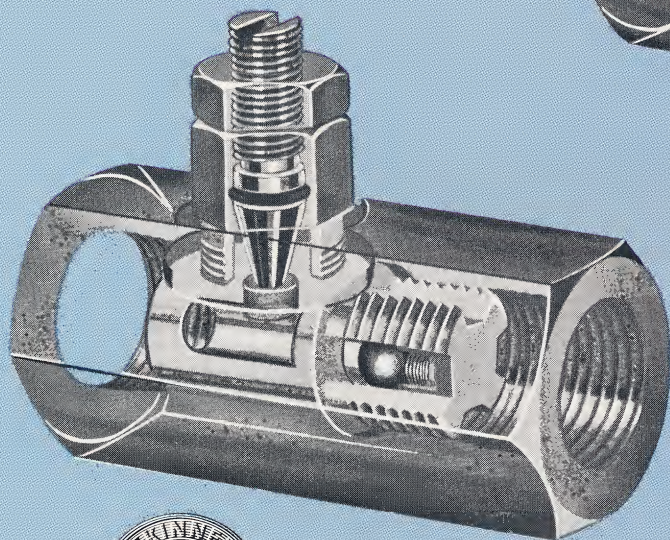
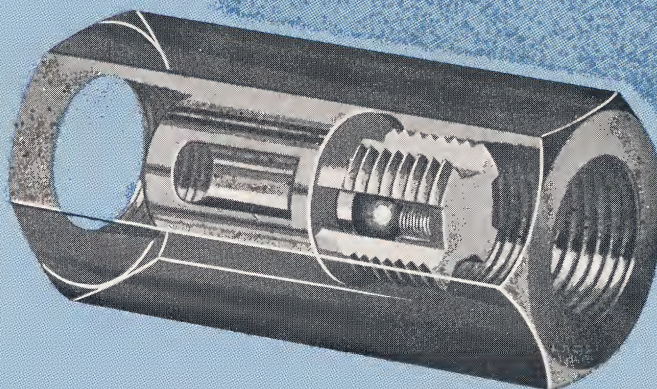
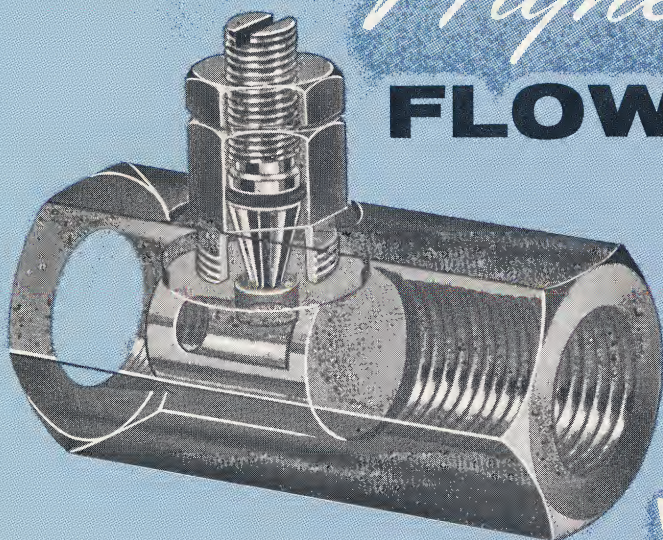
Highest Quality

FLOW CONTROL

NEEDLE

CHECK

VALVES



This catalog contains application and engineering data on the new Skinner Flow Control, Needle and Check Valves. These valves, which are designed for a host of fluid power control applications, are built to Skinner's high-quality standards to provide long life and dependable, accurate service. The addition of these new valves to Skinner's top quality line of solenoid valves provides additional answers to modern control problems.

SKINNER FLOW CONTROL
VALVES

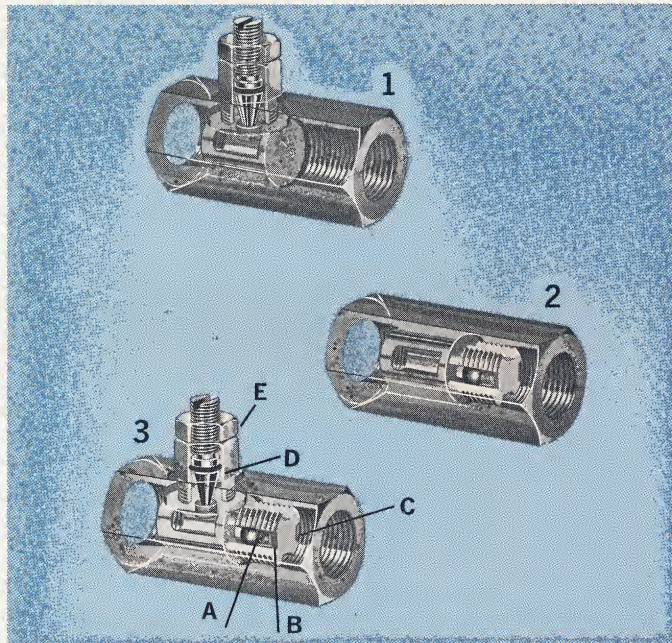
SKINNER ELECTRIC VALVE DIVISION
SKINNER PRECISION INDUSTRIES, INC. • NEW BRITAIN, CONNECTICUT, U.S.A.

SKINNER FLOW CONTROL VALVES HAVE TWICE THE FLOW OF THE LEADING COMPETITIVE VALVES

For example, Skinner's new flow control valves, when tested against those of the leading competition, showed the following:

- Skinner $\frac{1}{8}$ " valve—twice the flow as competitor's $\frac{1}{8}$ " valve.
- Skinner $\frac{1}{4}$ " valve—better than competitor's $\frac{3}{8}$ " valve.
- Skinner $\frac{3}{8}$ " valve—same flows as competitor's $\frac{3}{4}$ " valves.

FLOW CONTROL VALVE FEATURES



1. Needle Valve 2. Check Valve 3. Flow Control Valve
A. Ball B. Spring C. Cage D. Needle E. Locknut

Skinner's unique Flow Control Valve design* not only offers greater capacity size for size but many additional features:

Superior life on liquids or gases.

Compact, in-line self-cleaning design.

Shockproof under extreme surge.

May be mounted in any position.

Stainless steel spring, cage, ball and metering stem.

Precise metering control.

Pipe sizes of $\frac{1}{8}$ ", $\frac{1}{4}$ " and $\frac{3}{8}$ " NPTF dry-seal threads.

Brass body.

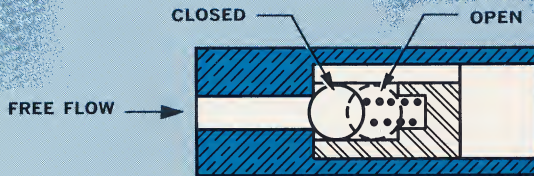
Unique cage construction makes valves ideal for both low- and high-pressure systems.

Working pressures from 0 to 2000 PSIG.

Standard temperature range minus 65°F to plus 180°F.

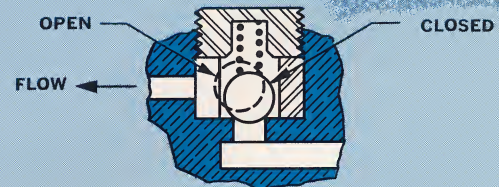
*Pat. Pending

SKINNER IN-LINE DESIGN



The straight flow-through design eliminates angular and dead-end, passages and flow through the spring. The valve is self-cleaning, and foreign particles can't filter out to block flow. Since the spring is isolated from the flow, spring suck-out can't occur. There is no restriction in the movement of the ball from the fully-closed to the fully-open position. There are no unbalanced forces to cause ball or guide bushing wear. Since misalignment of the cage and ball relative to the seating surface is not possible, long seat life is ensured.

COMPETITIVE DIVERTED FLOW

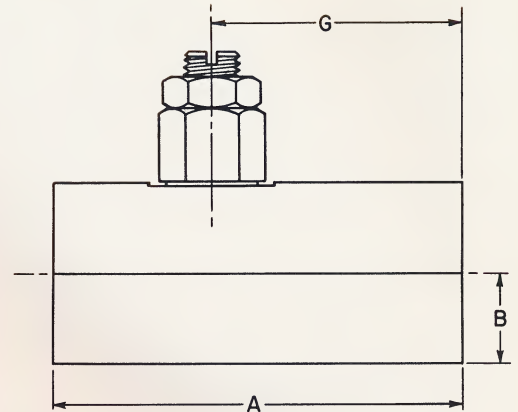


In the diverted flow design, the ball moves to a half-open position under flow, restricting the downstream passage. Fluid flows in and around the spring so that spring suck-out often occurs. Side forces push the ball against the wall of the guide bushing, distorting the bearing surface and causing improper seating and severe wear.

FLOW CONTROL VALVES

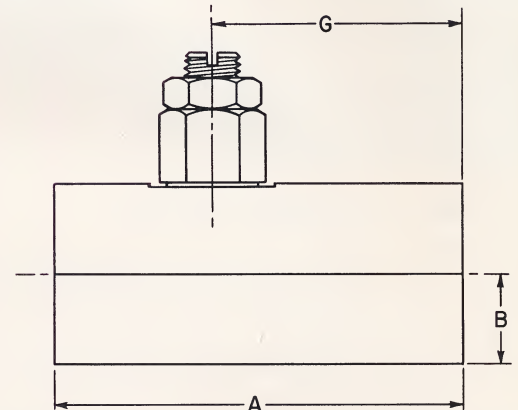
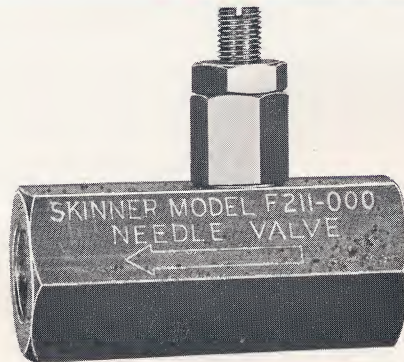
The Skinner flow control valve consists of a combination of a check valve to provide unrestricted flow in one direction and a needle valve to provide metered flow in the opposite direction. The check portion of this valve contains an exclusive cage design that guarantees, under all conditions, positive ball seating against its orifice. The design is such that the stainless steel ball can move forward or backward only, and no side movement is possible. This feature ensures even axial flow and low-pressure differential to open or close the check orifice. As a result, these valves are ideal for low- or high-pressure applications. In addition, the cage design prevents spring distortion and suck-out.

The needle valve is provided with a precision stainless steel metering stem. The fine threads of the metering stem permit a wide range of adjustment from fully open to fully closed and are completely isolated from the medium by an "O" ring. The needle valve is fully adjustable under pressure, and a positive stop prevents back-out of the metering stem. A locknut holds adjustments under vibration and shock.



NEEDLE VALVES

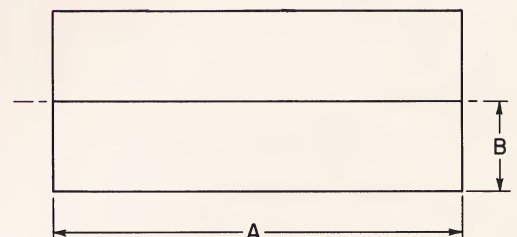
The Skinner needle valves are designed to provide high flow with a wide range of precise adjustments. The stainless steel metering stem has extra-fine threads that permit this adjustment from fully open to fully closed. Adjustments can be easily and safely set and secured under pressure, because an "O" ring isolates the sensitive adjusting threads from medium. A positive stop is provided to prevent the metering stem from being backed out of the valve. A locknut is also provided to ensure metering stem adjustment under conditions of vibration and shock.



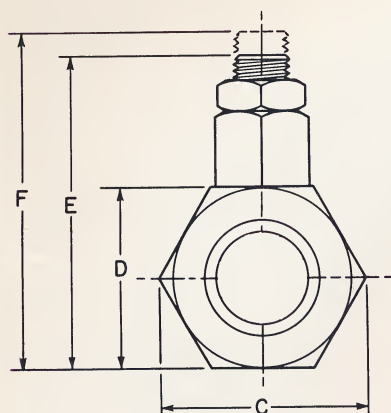
CHECK VALVES

Skinner check valves feature a straight flow-through design with unique cage construction. This exclusive cage construction encloses a stainless steel ball and provides a four-point guide to ensure proper seating under all conditions. A stainless steel captive spring cannot be distorted or drawn out of position. In operation the ball can move only forward or backward with no side movement, ensuring even axial flow and low pressure differential to open or close the orifice.

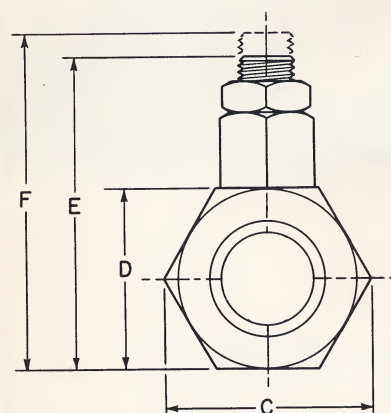
Skinner straight flow-through check valves provide high unrestricted flow with minimum pressure drop, and are ideal in low- or high-pressure applications.



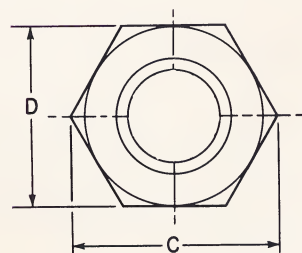
ALL LIST PRICES ARE SUBJECT TO TRADE AND QUANTITY DISCOUNTS.



LIST PRICE	CATALOG NUMBER	PIPE SIZE NPTF	ORIFICE DIAMETER (inches)		C _v FACTOR (fully open)*		TOTAL FLOW C _v FACTOR
			Needle	Check	Needle	Check	
\$3.55	F111-200	1/8"	.109	.147	.18	.48	.53
4.90	F121-200	1/4"	.156	.218	.36	.86	.91
6.40	F131-200	3/8"	.234	.265	.57	1.70	1.90
DIMENSIONS (inches)							
CATALOG NUMBER	A	B	C	D	E	F	G
F111-200	1 5/8	1 1/32	5 1/64	1 1/16	1 1/4	1 13/32	6 1/64
F121-200	2 1/16	7/16	1	7/8	1 37/64	1 49/64	1 1/4
F131-200	2 15/32	17/32	1 15/64	1 1/16	1 53/64	2 3/32	1 1/2



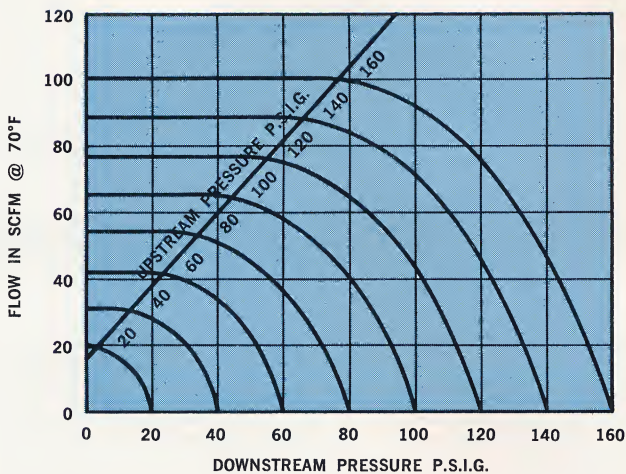
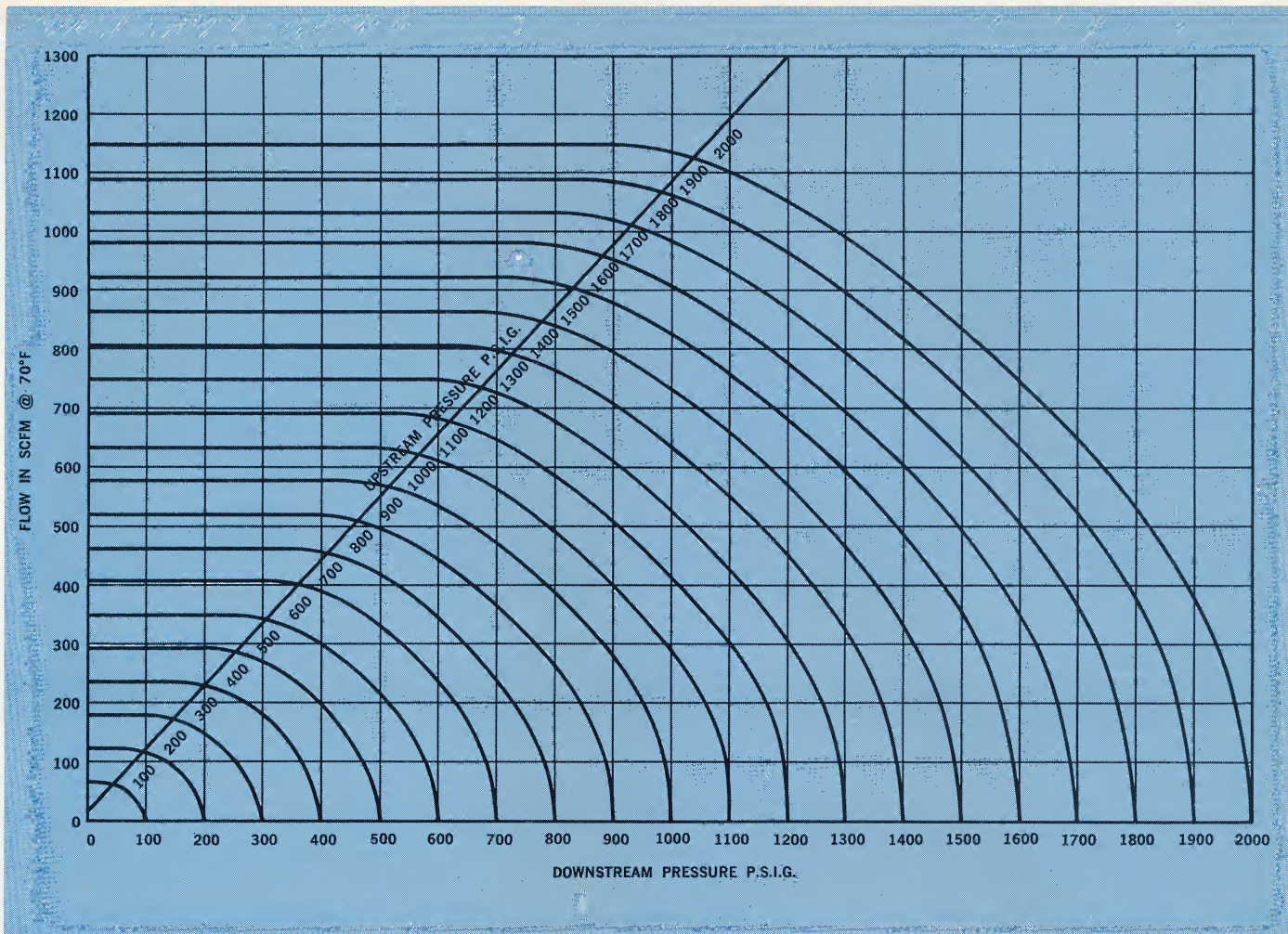
LIST PRICE	CATALOG NUMBER	PIPE SIZE NPTF	ORIFICE DIAMETER (inches)		C _v FACTOR (fully open)*		TOTAL FLOW C _v FACTOR
			Needle	Check	Needle	Check	
\$3.20	F211-000	1/8"	.109	—	.18	—	.18
4.50	F221-000	1/4"	.156	—	.36	—	.36
6.30	F231-000	3/8"	.234	—	.57	—	.57
DIMENSIONS (inches)							
CATALOG NUMBER	A	B	C	D	E	F	G
F211-000	1 5/8	1 1/32	5 1/64	1 1/16	1 1/4	1 13/32	6 1/64
F221-000	2 1/16	7/16	1	7/8	1 37/64	1 49/64	1 1/4
F231-000	2 15/32	17/32	1 15/64	1 1/16	1 53/64	2 3/32	1 1/2



LIST PRICE	CATALOG NUMBER	PIPE SIZE NPTF	ORIFICE DIAMETER (inches)		C _v FACTOR (fully open)*		TOTAL FLOW C _v FACTOR
			Needle	Check	Needle	Check	
\$2.55	F311-200	1/8"	—	.147	—	.48	.48
3.90	F321-200	1/4"	—	.218	—	.86	.86
4.80	F331-200	3/8"	—	.265	—	1.70	1.70
DIMENSIONS (inches)							
CATALOG NUMBER	A	B	C	D	E	F	G
F311-200	1 5/8	1 1/32	5 1/64	1 1/16	—	—	—
F321-200	2 1/16	7/16	1	7/8	—	—	—
F331-200	2 15/32	17/32	1 15/64	1 1/16	—	—	—

*Use this C_v factor for computing total flow of valve. To determine flow, select the appropriate C_v factor in this column. Refer to the proper flow chart on Page 5 or 6. The charts are computed for a valve with a C_v factor = 1 for water or air, and contain correction factors for other media. Refer to directions on Pages 5 and 6 for using charts.

AIR FLOW CHART FOR VALVE WITH $C_v=1$



Correction Factors

Acetylene.....	1.05
Ammonia.....	1.30
Argon.....	.95
Hydrogen.....	3.85
Methane.....	1.33
Neon.....	1.20
Nitrogen.....	1.02
Oxygen.....	.95
Propane.....	.80

HOW TO DETERMINE FLOW RATE

Known Factors

- C_v factor of valve from catalog listing (page 4).
- Upstream and downstream pressure in PSIG.
- Medium.

- Locate the known downstream pressure on the chart above.
- From that point draw a vertical line until it intersects the known upstream pressure line. At this point draw a horizontal line to left until it meets the ordinate (left vertical scale). Read the scale at this point indicating the flow in standard cubic feet per minute (SCFM) for a valve with a C_v factor = 1.
- Refer to the catalog listings on page 4 for the C_v factor of the valve in question. Multiply the flow in step 2 by the valve C_v factor. This answer is the air flow through this particular valve.
- If gas to be used is other than air, multiply this answer by the correction factor listed above.

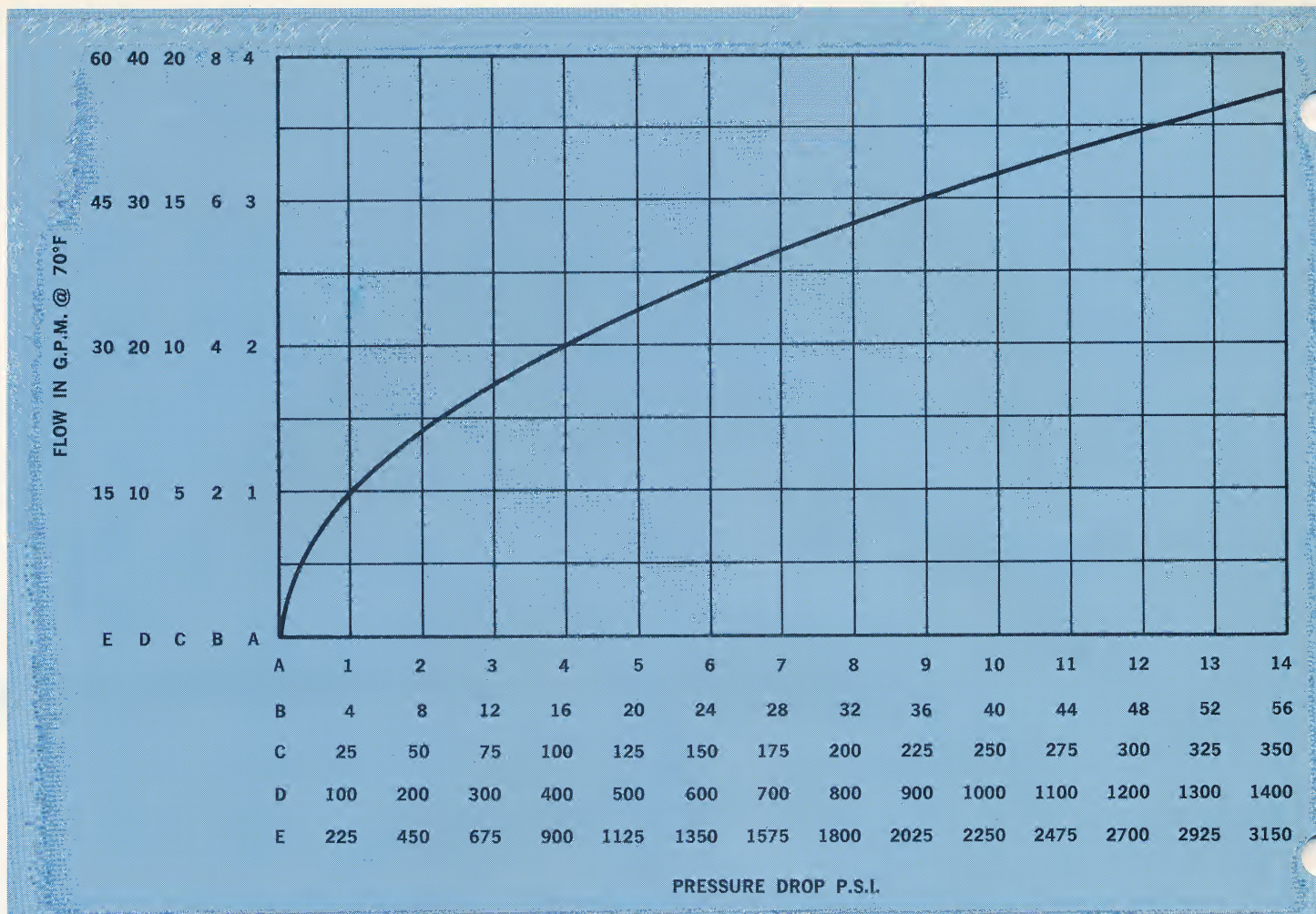
Example:

Known Factors

- C_v factor $\frac{3}{8}$ " Flow Control Valve—1.90
- Downstream Pressure = 60 PSIG
Upstream Pressure = 160 PSIG
- Medium—air

- Downstream pressure is 60 PSIG—draw a vertical line to intersect the upstream pressure of 160.
- A horizontal line is drawn from this point to the vertical (ordinate) scale and flow of 100 SCFM is indicated.
- Multiply $100 \times C_v$ factor 1.90 = 190 SCFM
- Medium is air, so no correction factor is required.

WATER FLOW CHART FOR VALVE WITH $C_v=1$



HOW TO DETERMINE FLOW RATE

Known Factors

- C_v factor of valve from catalog listing (page 4)
 - Pressure drop in PSIG across valve (your system)
 - Medium
- On the chart above draw a vertical line from the known pressure drop to intersect the curve. At this point draw a horizontal line to the left until it meets the appropriate ordinate (left vertical scale).
 - At this point read the flow in GPM on the ordinate line. This figure indicates the flow for a valve with a C_v factor = 1.
 - Refer to the catalog listings on page 4 for the C_v factor of the valve in question. Multiply the figure in step 2 above by the valve C_v factor. This answer is the water flow through this particular valve.
 - If the medium to be used is other than water, multiply this answer by the correction factor listed in the chart above. Contact Skinner for correction factors not listed.

Example:

Known Factors

- C_v factor $\frac{1}{8}$ " flow control valve—.53
- Pressure drop—100 PSIG
- Medium—hydraulic oil—MIL-H-5606A

Correction Factors

Alcohol	1.123
Benzene	1.052
Gasoline	1.204
Kerosene	1.111
Hydraulic oil Mil-H-5606A	1.087
Sea water	.99

- Vertical line intersects curve at 10 GPM.
- $.53 \times 10 = 5.3$ GPM.
- $5.3 \text{ GPM} \times 1.087$ (correction factor for hydraulic oil) = 5.76 GPM.

Skinner Valves are sold through authorized Stocking Distributors. These men are highly trained hydraulics and pneumatic specialists. Stocking Distributors maintain adequate stocks of Skinner Valves to provide immediate delivery.

The Skinner Field Representatives and Stocking Distributors are qualified to provide answers to your control problems. If you need specialized application information, Skinner engineers can provide this service. When requesting application information, supply as much data as possible about the application involved.



SKINNER ^{ELECTRIC} VALVES

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GENERAL INFORMATION

The valves listed in this catalog are the most popular manufactured by Skinner. Catalog numbers shown are for valves with grommet housings (Option ES) and conduit housings (Option EC). All valves listed are designed with Type D varnish-impregnated coils. The General Purpose Valves shown are suitable for applications indoors under atmospheric conditions.

CATALOG CONTENTS AND LISTINGS CODE

Valves listed in **color** are normally carried in factory stock for immediate shipment. Catalog numbers marked with a dagger (†) indicate valves stocked nationwide by Skinner Stocking Distributors. Skinner distributors stock many additional valves that are popular in their localized area.

In addition to the valve listings, each table in this catalog gives the valves' maximum operating pressure differentials, port sizes, C_v factors, weights and prices. Flow charts are included for air and liquid. (The C_v factor of a valve is the quantity of 60°F water, expressed in gallons per minute, which will flow through a valve with a one PSI pressure drop.)

EXPLOSION-PROOF VALVES

Explosion-proof valves are recommended for use in certain hazardous locations defined by Underwriters Laboratories, Inc., as:

Class 1, Group D

Class 2, Groups F and G

Class 1 locations are those in which flammable gases or vapors are or may be present in sufficient quantities to produce explosive or ignitable mixtures.

Group D atmospheres are gasoline, hexane, naphtha, benzene, propane, alcohol, acetone, lacquer, solvent vapors and natural gases.

Class 2 locations are hazardous because of the presence of combustible dusts. **Group F** atmospheres contain carbon black, coal or coke dust. **Group G** atmospheres contain flour, starch or grain dust.

MEDIA

In general, most Skinner valves can be used with all common media. However, some valves—particularly Three-Way Valves used with water and some petroleum products, normally require plunger assembly insert modifications. This is also true of valves used for dead-end gas service, a condition in which a Two-Way Normally Open or a Three-Way Valve is required to be continuously energized on repetitive cycles for over 1½ hours.

OPTIONS

Most valves listed in this catalog can be modified to provide many options such as electrical housing options, mounting options, flow control options, voltage and frequency options, and porting options to meet any application. Please refer to the Skinner General Catalog for specific options.

SELECTION GUIDE

Normal Applications—Select a valve that will be de-energized (off) a majority of the time.

Fail-Safe Applications—Select a valve that will fail in the safe position with the absence of electrical current.

Standard Pressure Ratings—Select a valve with maximum operating pressure differential equal to or higher than the actual operating pressure differential.

TYPICAL SPECIFICATIONS

	TWO WAY						THREE WAY				TWO AND THREE		FOUR-WAY	
	A2	B	C	V5, X5	R, XR	L, XL	B	V5, X5	A	L, XL	V10, X10	A10	V9	A35
Body material	Brass	Stainless Steel	Brass or Stainless Steel	Stainless Steel	Brass	Brass	Stainless Steel	Stainless Steel	Zinc	Brass	Stainless Steel	Stainless Steel	Zinc	Stainless Steel
Internal parts not including shading ring	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel & Brass	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel & Brass	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
Normally open		•		•	•	•	•	•	•	•	•	•	•	
Normally closed	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Dual purpose				•							•	•		•
Directional control							•	•	•	•	•	•		
Multipurpose							•	•	•					
Pipe size NPT (inches)***	½	⅛, ¼ ***	⅛ ***	⅛, ¼, ⅜	¼	⅜, ½, ¾, 1	⅛, ¼ ***	⅛, ¼	¼ ***	⅜, ½, ¾	⅛ cage	¼ cage	¼	cage
Power consumption (watts)	18	7	8	10	10	10	7	10	16	10	10	16	20*	16
Maximum operating** pressure differential (PSI) standard ratings	15	400	275	3000	1250	150	250	400	250	150	1000	3000	150	3000
Vacuum	•	•	•	•			•	•	•				•	

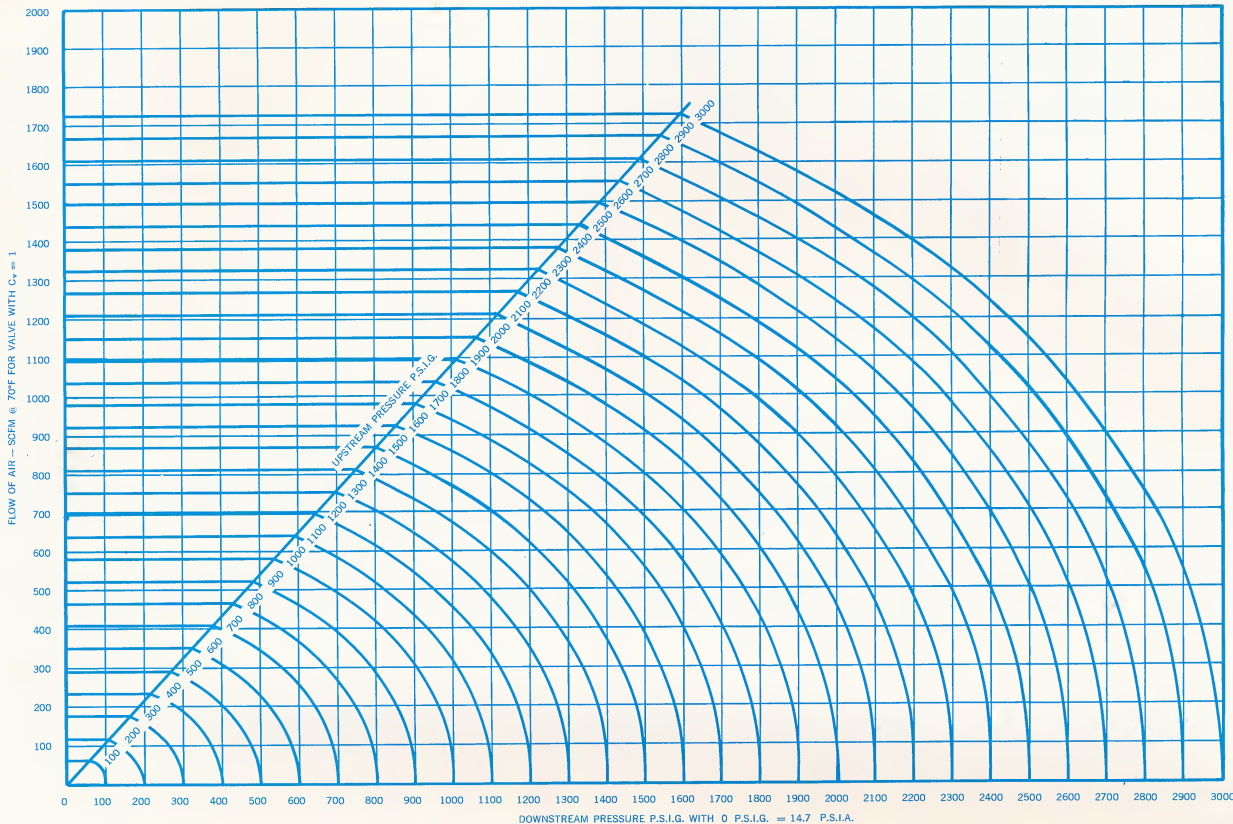
*2 coils—10 watts each.

**Depending upon orifice size.

***Except B series which is PTF (short dry seal thread), C series and A series NPTF.

FLOW CHARTS: Flow charts for air and water are based on a valve with a C_v factor of 1. Correction factors are included for other media.

AIR FLOW CHART FOR VALVE WITH C_v FACTOR = 1

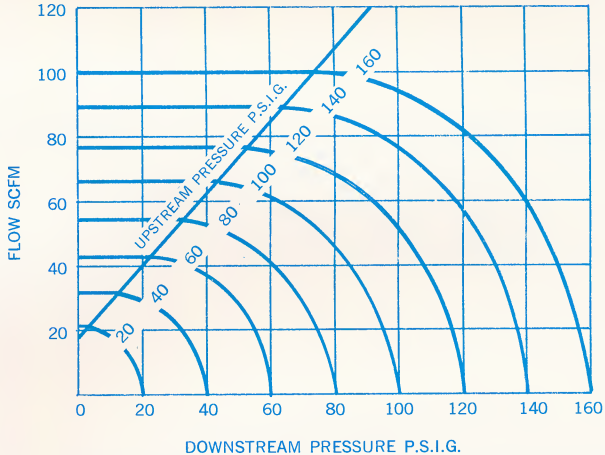


CORRECTION FACTORS @ 70° F.

Acetylene.....	1.05	Neon.....	1.20
Ammonia.....	1.30	Nitrogen.....	1.02
Argon.....	.85	Oxygen.....	.95
Hydrogen.....	3.85	Propane.....	.80
Methane.....	1.33		

For correction factor of gases not listed, use the following formula:

$$\text{Correction Factor} = \sqrt{\frac{1}{\text{Specific gravity of gas}}}$$



DETERMINING THE FLOW RATE OF A VALVE USED ON AIR SERVICE

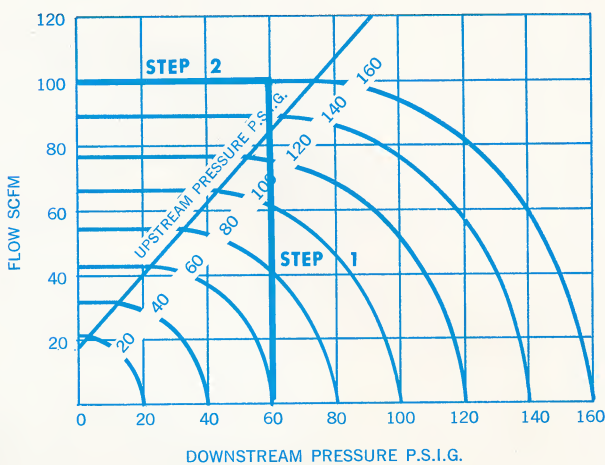
Must Have Known Factors—Medium used, upstream and downstream pressure in PSIG and C_v factor.

EXAMPLE:

- Medium—air
- Downstream pressure—60 PSIG
- Upstream pressure—160 PSIG
- C_v Factor V52— $\frac{1}{16}$ " orifice valve—.095

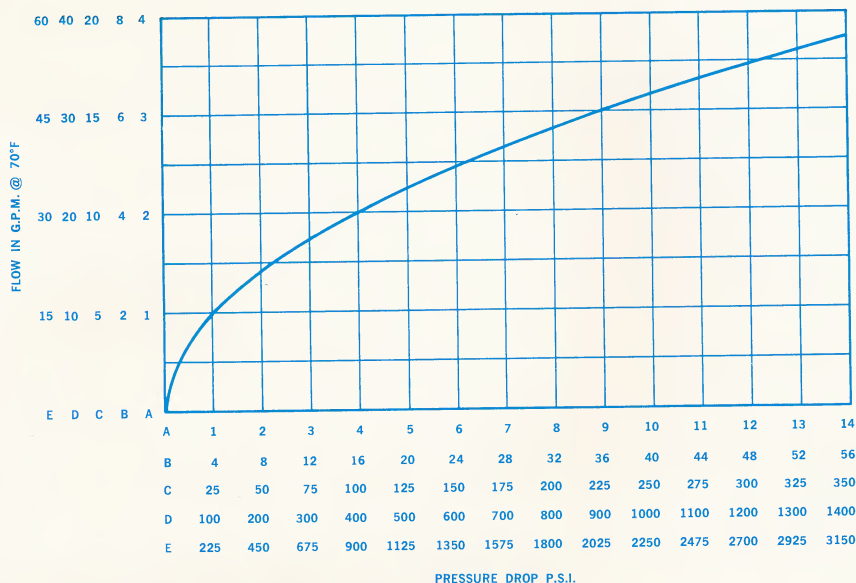
USING CHART:

- Step 1.** Locate the known downstream pressure (60 PSIG).
- Step 2.** From this point draw a vertical line until it intersects the known upstream pressure line (160 PSIG).
- Step 3.** At this point draw a horizontal line to meet the left vertical scale; 100 is the flow in standard cubic feet per minute (SCFM) for a valve with a C_v factor of 1.
- Step 4.** Multiply C_v factor of the valve (.095) by 100 for air flow through this valve. This answer would be multiplied by a correction factor if the medium used was not air.



FLOW CHARTS: Flow charts for air and water are based on a valve with a C_v factor of 1. Correction factors are included for other media.

WATER FLOW CHART FOR VALVE WITH C_v FACTOR = 1



CORRECTION FACTORS @ 70° F.

Alcohol.....	1.123
Benzene.....	1.052
Gasoline.....	1.204
Kerosene.....	1.111
Hydraulic Oil MIL-H-5606A.....	1.087
Sea Water.....	.99

For correction factor of liquids not listed, use the following formula:

$$\text{Correction Factor} = \sqrt{\frac{1}{\text{Specific gravity of liquid}}}$$

HOW TO DETERMINE FLOW RATE OF A VALVE USED ON WATER SERVICE

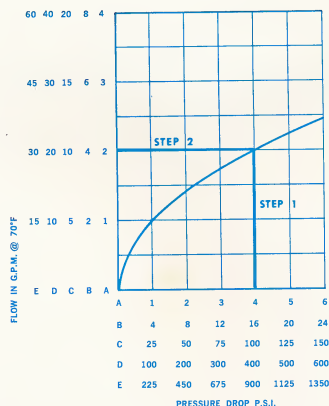
Must Have Known Factors—Medium used, pressure drop in PSIG across the valve (the system you are using in the application), the C_v factor of the valve under consideration.

EXAMPLE

Medium—Hydraulic Oil MIL-H-5606A

Pressure Drop—100 PSIG

C_v Factor—V52 valve orifice size $\frac{1}{8}$ " is .280



USING CHART

Step 1. Locate the known pressure drop (100 PSIG) on the horizontal scale. Note that the chart has 5 scales (A, B, C, D, E) for the vertical and horizontal axes. Use the appropriate scale. At this point draw a vertical line to intersect the curve.

Step 2. From this intersection point, draw a horizontal line to the left vertical scale. At this point, read the flow in gallons per minute (GPM): 10 GPM. This figure is the flow for a valve with a C_v factor = 1.

Step 3. Multiply this figure (10 GPM) by the C_v factor of the valve (known factor taken from the Catalog listing) .280: $.280 \times 10 = 2.80$ GPM. This valve provides 2.80 GPM of water flow.

Step 4. Since our media is MIL-H-5606A hydraulic oil, we obtain the correction factor from the chart (1.087) and multiply by .280. $.280 \times 1.087 = 3.04$ GPM

TWO-WAY B SERIES

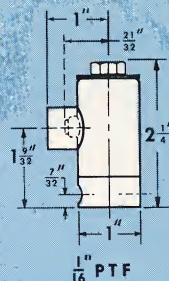
SUB-MINIATURE STAINLESS STEEL TWO-WAY SOLENOID VALVES

MATERIAL—Stainless steel body and internal parts.

WEIGHT—5 oz.

POWER CONSUMPTION—7 watts maximum.

MEDIA—Air, inert gases, hydraulic fluids, petroleum, vegetable oils, water, kerosene, gasoline, freons, and many semi-corrosive media. Water over 180°F and some petroleum products can require plunger assembly modification.



PRICES SHOWN FOR 12/60, 24/60, 115/60, 230/60, 6V, 12V, 24V DC

*MAXIMUM OPERATING PRESSURE DIFFERENTIAL (PSI)		ORIFICE DIA. (inch)	Cv FACTOR	GROMMET HOUSING OPTION ES				1/4" NPT CONDUIT HOUSING OPTION EC			
				1/16" PTF	LIST PRICE	1/8" PTF	LIST PRICE	1/16" PTF	LIST PRICE	1/8" PTF	LIST PRICE
				CATALOG NO.		CATALOG NO.		CATALOG NO.		CATALOG NO.	
AC	DC										
TWO-WAY NORMALLY OPEN, TYPE B1											
400	400	1/32	.019	B1DA9400	\$11.75	B1DA1400	\$11.75†	B1DB9400	\$12.25	B1DB1400	\$12.25†
200	200	3/64	.045	B1DA9200	11.75	B1DA1200	11.75†	B1DB9200	12.25	B1DB1200	12.25†
TWO-WAY NORMALLY CLOSED, TYPE B2											
400	400	1/32	.019	B2DA9400	\$ 9.00	B2DA1400	\$ 9.00†	B2DB9400	\$ 9.50	B2DB1400	\$ 9.50†
250	250	3/64	.045	B2DA9250	9.00	B2DA1250	9.00†	B2DB9250	9.50	B2DB1250	9.50†
175	175	1/16	.065	B2DA9175†	9.00	B2DA1175	9.00†	B2DB9175	9.50	B2DB1175	9.50†
50		1/8	.240	B2DA9052	9.00†	B2DA1052	9.00†	B2DB9052	9.50†	B2DB1052	9.50†
	25	1/8	.240	B2DA9026	9.00†	B2DA1026	9.00†	B2DB9026	9.50†	B2DB1026	9.50†

MINIATURE SHUT-OFF TWO-WAY SOLENOID VALVES

TWO-WAY C SERIES

MATERIAL—Brass body, stainless steel internal parts.

WEIGHT—12 oz.

POWER CONSUMPTION—8 watts maximum.

MEDIA—Air, hydraulic fluids, inert gases, water, petroleum products, freons, vegetable oils, etc. Water over 180°F and some petroleum products can require plunger assembly insert modification.

PRICES SHOWN FOR 115/60, 230/60, 6V, 12V DC AND 24/50, 115/50, 230/50 AC

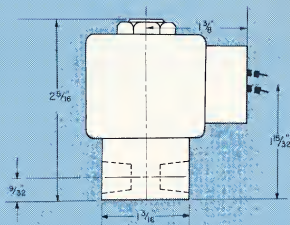
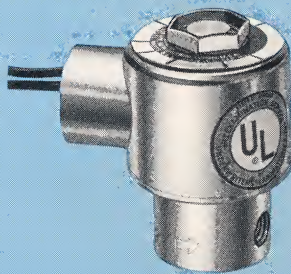
*MAXIMUM OPERATING PRESSURE DIFFERENTIAL (PSI)		ORIFICE DIA. (inch)	PIPE SIZE (NPTF) (inch)	Cv FACTOR	GROMMET HOUSING OPTION ES		1/2" NPT CONDUIT HOUSING OPTION EC	
					CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE
AC	DC							
275		1/16	1/8	.105	C2DA1277	\$ 7.50	C2DB1277	\$ 8.00
	250	1/16	1/8	.105	C2DA1251	7.50	C2DB1251	8.00
130		7/64	1/8	.250	C2DA1132	7.50	C2DB1132†	8.00
	80	7/64	1/8	.250	C2DA1081	7.50	C2DB1081	8.00
90		1/8	1/8	.308	C2DA1092	7.50	C2DB1092	8.00
	50	1/8	1/8	.308	C2DA1051	7.50	C2DB1051	8.00
60		5/32	1/8	.390	C2DA1062	7.50	C2DB1062	8.00
	30	5/32	1/8	.390	C2DA1031	7.50	C2DB1031	8.00

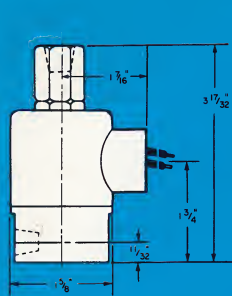
Catalog numbers in color indicate valves carried in Factory Stock. Catalog numbers followed by a dagger (†) indicate valves stocked nationwide by Skinner Stocking Distributors.

*Higher than standard pressure ratings are available. Please consult Skinner.

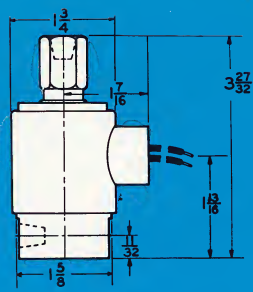
**PTF (short dryseal thread).

†Price does not include fittings.

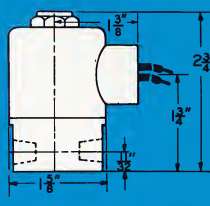




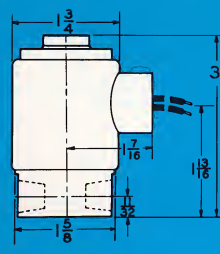
V51 Series



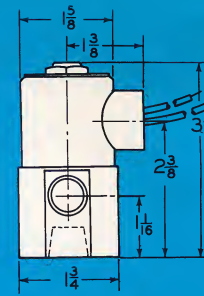
X51 Series



V52, V52H, V57 Series



X52, X52H Series



V52 3/8

TWO-WAY STAINLESS STEEL SOLENOID VALVES

TWO-WAY V5 SERIES

MATERIAL—Stainless steel.

WEIGHT—Less than 1.5 lbs.

POWER CONSUMPTION—10 watts maximum.

MEDIA—Air, inert gases, vacuum, hydraulic fluids, petroleum products, freons, water, steam, and many semicorrosive media. Steam, water and some petroleum product applications normally require plunger assembly insert modification.

PRICES SHOWN FOR 115/60, 230/60 AC, 6V, 12V DC, 24/50, 115/50, 250/50 AC

* MAXIMUM OPERATING PRESSURE DIFFERENTIAL (PSI)		ORIFICE DIA. (inch)	C _v FACTOR	GROMMET HOUSING OPTION ES			½" NPT CONDUIT HOUSING OPTION EC			EXPLOSION-PROOF CONSTRUCTION ½" NPT CONDUIT		
				CATALOG NO.		LIST PRICE	CATALOG NO.		LIST PRICE	CATALOG NO.		LIST PRICE
				⅛" NPT	¼" NPT		⅛" NPT	¼" NPT		⅛" NPT	¼" NPT	
AC	DC											
TWO-WAY NORMALLY OPEN, TYPE V51 STANDARD, TYPE X51 EXPLOSION PROOF												
200	200	¾	.052	V51DA1200	V51DA2200	\$12.25	V51DB1200	V51DB2200	\$12.75	X51DB1200	X51DB2200	\$18.50
150	150	⅙	.095	V51DA1150	V51DA2150	12.25	V51DB1150	V51DB2150	12.75	X51DB1150	X51DB2150	18.50
125	125	⅜	.166	V51DA1125	V51DA2125	12.25	V51DB1125	V51DB2125†	12.75	X51DB1125	X51DB2125	18.50
TWO-WAY NORMALLY CLOSED, TYPE V52 STANDARD, TYPE X52 EXPLOSION PROOF, TYPE V52 ⅜"												
250	250	¾	.052	V52DA1250	V52DA2250	\$10.00	V52DB1250	V52DB2250	\$10.50	X52DB1250	X52DB2250	\$16.25
200	200	⅙	.095	V52DA1200	V52DA2200	10.00	V52DB1200	V52DB2200	10.50	X52DB1200	X52DB2200	16.25
125	125	⅜	.166	V52DA1125	V52DA2125	10.00	V52DB1125	V52DB2125†	10.50	X52DB1125	X52DB2125	16.25
100	100	⅛	.280	V52DA1100	V52DA2100	10.00	V52DB1100	V52DB2100†	10.50	X52DB1100	X52DB2100†	16.25
75		⅝	.404	V52DA1077	V52DA2077	10.00	V52DB1077	V52DB2077	10.50	X52DB1077	X52DB2077	16.25
	50	⅝	.404	V52DA1051	V52DA2051	10.00	V52DB1051	V52DB2051	10.50	X52DB1051	X52DB2051	16.25
50		⅜	.500	V52DA1052	V52DA2052	10.00	V52DB1052	V52DB2052†	10.50	X52DB1052	X52DB2052	16.25
	25	⅜	.500	V52DA1026	V52DA2026	10.00	V52DB1026	V52DB2026	10.50	X52DB1026	X52DB2026	16.25
20		¼	.752	V52DA1022	V52DA2022	10.00	V52DB1022	V52DB2022†	10.50	X52DB1022	X52DB2022	16.25
	5	¼	.752	V52DA1006	V52DA2006	10.00	V52DB1006	V52DB2006	10.50	X52DB1006	X52DB2006	16.25
15		⅙	1.06	—	V52DA2017	11.00	—	V52DB2017	11.50			
5-10		⅜	2.00	⅜" NPT	V52DA3012	12.00	⅜" NPT	V52DB3012	12.50	NOT AVAILABLE		
0-5		⅜	2.00	⅜" NPT	V52DA3007	12.00	⅜" NPT	V52DB3007	12.50			
TWO-WAY NORMALLY CLOSED, HIGH PRESSURE TYPE V52H STANDARD, TYPE X52H EXPLOSION PROOF												
3000		⅓	.013	V52HDA13002	V52HDA23002	\$15.75	V52HDB13002	V52HDB23002	\$16.25	X52HDB13002	X52HDB23002	\$22.00
	2500	⅓	.013	V52HDA12501	V52HDA22501	15.75	V52HDB12501	V52HDB22501	16.25	X52HDB12501	X52HDB22501	22.00
1500		⅜	.046	V52HDA11502	V52HDA21502	15.75	V52HDB11502	V52HDB21502†	16.25	X52HDB11502	X52HDB21502	22.00
	1000	⅜	.046	V52HDA11001	V52HDA21001	15.75	V52HDB11001	V52HDB21001	16.25	X52HDB11001	X52HDB21001	22.00
1250		⅙	.058	V52HDA11252	V52HDA21252	15.75	V52HDB11252	V52HDB21252	16.25	X52HDB11252	X52HDB21252	22.00
	500	⅙	.058	V52HDA10501	V52HDA20501	15.75	V52HDB10501	V52HDB20501	16.25	X52HDB10501	X52HDB20501	22.00
500		⅜	.092	V52HDA10502	V52HDA20502	15.75	V52HDB10502	V52HDB20502	16.25	X52HDB10502	X52HDB20502	22.00
	200	⅝	.092	V52HDA10201	V52HDA20201	15.75	V52HDB10201	V52HDB20201	16.25	X52HDB10201	X52HDB20201	22.00
TWO-WAY NORMALLY CLOSED DUAL PURPOSE TYPE V57												
400	400	⅓	.024	V57DA1400	V57DA2400	\$15.75	V57DB1400	V57DB2400	\$16.25	CONSULT SKINNER		
125	125	⅜	.052	V57DA1125	V57DA2125	11.00	V57DB1125	V57DB2125	11.50			
75	75	⅙	.095	V57DA1075	V57DA2075	11.00	V57DB1075	V57DB2075	11.50			
45	45	⅜	.166	V57DA1045	V57DA2045	11.00	V57DB1045	V57DB2045	11.50			
30	30	⅙	.280	V57DA1030	V57DA2030	11.00	V57DB1030	V57DB2030	11.50			

Catalog numbers in color indicate valves carried in Factory Stock. Catalog numbers followed by a dagger (†) indicate valves stocked nationwide by Skinner Stocking Distributors.

*Higher than standard pressure ratings are available. Please consult Skinner.

LARGE CAPACITY HIGH-PRESSURE TWO-WAY SOLENOID VALVES

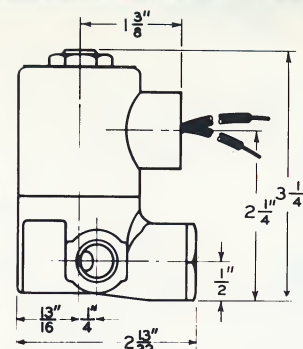
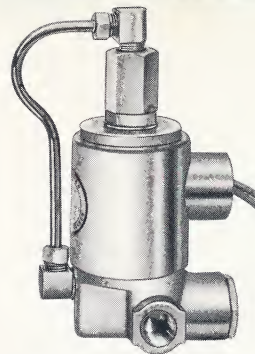
TWO-WAY R SERIES

MATERIAL—Forged naval brass body, stainless steel internal parts.

WEIGHT—1.25 lbs.

POWER CONSUMPTION—10 watts maximum (R2H6 12 watts).

MEDIA—Air, oil, water, inert gases, and other common media. Normally open valves used on water or continuously energized (over 1½ hours) air applications normally require pilot plunger assembly insert modification.



R2 Series

PRICES SHOWN FOR 115/60, 230/60 AC, 6V, 12V DC, (R2H6-6V, 12V DC ONLY) 24/50, 115/50, 250/50 AC

OPERATING PRESSURE DIFFERENTIAL (PSI)			ORIFICE DIA. (inch)	PIPE SIZE NPTF (inch)	Cv FACTOR	GROMMET HOUSING OPTION ES		½" NPT CONDUIT HOUSING OPTION EC		EXPLOSION-PROOF ½" NPT CONDUIT	
MAXIMUM		MINIMUM				CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE
AC	DC										
TWO-WAY NORMALLY OPEN, TYPE RP1 STANDARD, TYPE XRP1 EXPLOSION PROOF											
150	150	5	¼	¼	.758	RP1DA2150	\$20.25	RP1DB2150†	\$20.75	XRP1DB2150	\$26.50
TWO-WAY NORMALLY CLOSED, TYPE R2 STANDARD, TYPE XR2 EXPLOSION PROOF											
200	200	5	¼	¼	.758	R2DA2200	\$15.25	R2DB2200†	\$15.75	XR2DB2200	\$21.50
TWO-WAY NORMALLY CLOSED, HIGH PRESSURE, TYPE R2H STANDARD, TYPE XR2H EXPLOSION PROOF											
1250		5	¼	¼	.758	R2HDA21252	\$21.00	R2HDB21252	\$21.50	XR2HDB21252	\$27.25
	1000	5	¼	¼	.758	R2H6DA21001	24.25	R2H6DB21001	24.75		
	500	5	¼	¼	.758	R2HDA20501	21.00	R2HDB20501	21.50	XR2HDB20501	27.25

TWO-WAY HIGH-FLOW SOLENOID VALVES

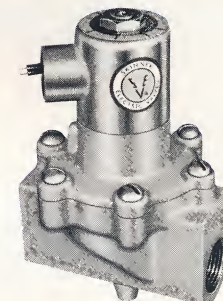
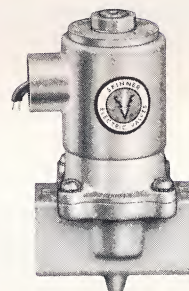
TWO-WAY L SERIES

MATERIAL—Forged naval brass body, stainless steel internal parts.

WEIGHT—½" from 2.5 to 3.0 lbs.; ¾" from 4 to 5 lbs.; 1" from 6 to 7 lbs.

POWER CONSUMPTION—LC2 is 8 watts maximum; all others are 10 watts maximum.

MEDIA—Air, oil, water, inert gases, and other common media. Normally open valves used on water or continuously energized (over 1½ hours) air applications normally require pilot plunger assembly insert modification.



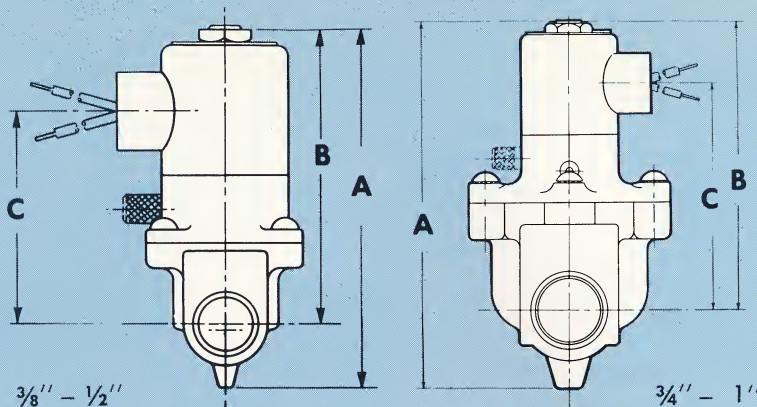
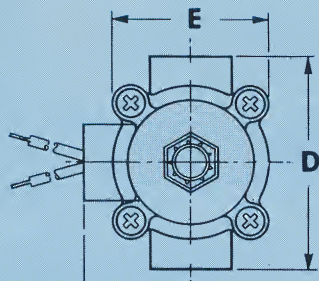
PRICES SHOWN FOR 115/60, 230/60 AC, 6V, 12V DC, 24/50, 115/50, 250/50 AC

*OPERATING PRESSURE DIFFERENTIAL (PSI)		ORIFICE DIA. (inch)	PIPE SIZE NPTF (inch)	Cv FACTOR	GROMMET HOUSING OPTION ES		½" NPT CONDUIT HOUSING OPTION EC		EXPLOSION PROOF CONSTRUCTION ½" NPT CONDUIT HOUSING	
MAXIMUM	MINIMUM				CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE
TWO-WAY NORMALLY OPEN, TYPE LP1 STANDARD, TYPE XLP1 EXPLOSION PROOF										
150	5	½	⅜	2.42	LP1DA3150	\$25.25	LP1DB3150	\$25.75	XLP1DB3150	\$31.50
150	5	½	½	2.81	LP1DA4150	25.25	LP1DB4150†	25.75	XLP1DB4150	31.50
150	5	¾	¾	7.32	LP1DA5150	37.25	LP1DB5150	37.75	XLP1DB5150	43.50
150	5	1	1	11.0	LP1DA6150	59.75	LP1DB6150	60.25	XLP1DB6150	66.25
TWO-WAY NORMALLY CLOSED, TYPE LC2, L2 STANDARD, TYPE XL2 EXPLOSION PROOF										
150	5	½	⅜	2.42	LC2DA3150	\$17.25	LC2DB3150	\$17.75		
150	5	½	⅜	2.42	L2DA3150	20.00	L2DB3150	20.50	XL2DB3150	\$26.25
150	5	½	½	2.81	LC2DA4150	17.25	LC2DB4150†	17.75		
150	5	½	½	2.81	L2DA4150	20.00	L2DB4150	20.50	XL2DB4150	26.25
150	5	¾	¾	7.32	L2DA5150	23.75	L2DB5150†	24.25	XL2DB5150	30.50
150	5	1	1	11.0	L2DA6150	27.75	L2DB6150†	28.25	XL2DB6150	54.00

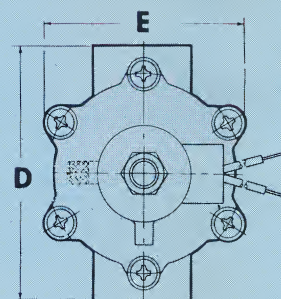
Catalog numbers in color indicate valves carried in Factory Stock. Catalog numbers followed by a dagger (†) indicate valves stocked nationwide by Skinner Stocking Distributors.

*Higher than standard pressure ratings are available. Please consult Skinner.

TWO-WAY HIGH-FLOW SOLENOID VALVES



TWO-WAY L SERIES



	A	B	C	D	E
LC2 3/8-1/2"	4	3 1/8	2 5/16	2 3/4	2
L2 3/8-1/2"	4 15/32	3 13/16	2 25/32	2 3/4	2
L2 3/4"	5 13/16	4 5/8	3 19/32	3 5/8	3 3/32
L2 1"	6 7/32	4 29/32	3 7/8	4 5/16	3 15/32
XL2 3/8-1/2"	4 5/8	4 1/8	2 15/16	2 3/4	2
XL2 3/4"	6 1/8	4 15/16	2 23/32	3 5/8	3 3/32
XL2 1"	6 1/2	5 7/32	4	4 5/16	3 15/32

SUB-MINIATURE STAINLESS STEEL THREE-WAY SOLENOID VALVES

MATERIAL—Stainless steel body and internal parts.

WEIGHT—5 oz.

POWER CONSUMPTION—7 watts maximum.

MEDIA—Air, inert gases, vacuum, hydraulic fluids, petroleum products, water, freons, and many semicorrosive media. Water applications, continuously energized (over 1 1/2 hours) air applications and some petroleum products applications normally require plunger assembly insert modification.

PRICES SHOWN FOR 12/60, 24/60, 115/60, 230/60 AC, 6V, 12V, 24V DC

THREE-WAY B SERIES

*MAXIMUM OPERATING PRESSURE DIFFERENTIAL (PSI)	ORIFICE INLET PORT		ORIFICE EXHAUST PORT		OPTION ES—GROMMET HOUSING				OPTION EC—1/4" NPT CONDUIT HOUSING			
					**1/16" PTF		**1/8" PTF		**1/16" PTF		**1/8" PTF	
	DIA. (inch)	Cv Factor	DIA. (inch)	Cv Factor	CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE
THREE-WAY NORMALLY CLOSED, TYPE B3												
200	1/32	.019	1/32	.019	B3DA9200	\$12.50	B3DA1200	\$12.50†	B3DB9200	\$13.00	B3DB1200	\$13.00†
150	3/64	.045	3/64	.045	B3DA9150†	12.50	B3DA1150	12.50†	B3DB9150	13.00	B3DB1150	13.00†
100	1/16	.065	3/64	.045	B3DA9100	12.50	B3DA1100	12.50†	B3DB9100	13.00	B3DB1100	13.00†
THREE-WAY NORMALLY CLOSED, EXHAUST TO ATMOSPHERE TYPE B3A												
200	1/32	.019	1/32	.019	B3ADA9200	\$11.75	B3ADA1200	\$11.75†	B3ADB9200	\$12.25	B3ADB1200	\$12.25†
150	3/64	.045	3/64	.045	B3ADA9150	11.75	B3ADA1150	11.75†	B3ADB9150	12.25	B3ADB1150	12.25†
100	1/16	.065	3/64	.045	B3ADA9100	11.75	B3ADA1100	11.75†	B3ADB9100	12.25	B3ADB1100	12.25†
THREE-WAY MULTIPURPOSE TYPE B4												
150	1/32	.019	1/32	.019	B4DA9150	\$13.25	B4DA1150	\$13.25†	B4DB9150	\$13.75	B4DB1150	\$13.75†
100	3/64	.045	3/64	.045	B4DA9100	13.25	B4DA1100	13.25†	B4DB9100	13.75	B4DB1100	13.75†
75	1/16	.065	3/64	.045	B4DA9075	13.25	B4DA1075	13.25†	B4DB9075	13.75	B4DB1075	13.75†
THREE-WAY NORMALLY, TYPE B5												
200	1/32	.019	1/32	.019	B5DA9200	\$12.50	B5DA1200	\$12.50†	B5DB9200	\$13.00	B5DB1200	\$13.00†
150	3/64	.045	3/64	.045	B5DA9150	12.50	B5DA1150	12.50†	B5DB9150	13.00	B5DB1150	13.00†
125	1/16	.065	3/64	.045	B5DA9125	12.50	B5DA1125	12.50†	B5DB9125	13.00	B5DB1125	13.00†
THREE-WAY DIRECTIONAL CONTROL TYPE B6												
250	1/32	.019	1/32	.019	B6DA9250	\$12.50	B6DA1250	\$12.50†	B6DB9250	\$13.00	B6DB1250	\$13.00†
200	3/64	.045	3/64	.045	B6DA9200	12.50	B6DA1200	12.50†	B6DB9200	13.00	B6DB1200	13.00†
175	1/16	.065	3/64	.045	B6DA9175	12.50	B6DA1175	12.50†	B6DB9175	13.00	B6DB1175	13.00†

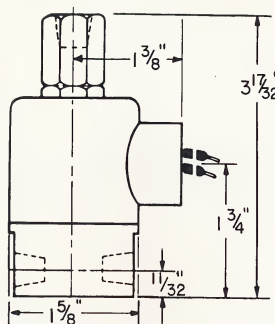
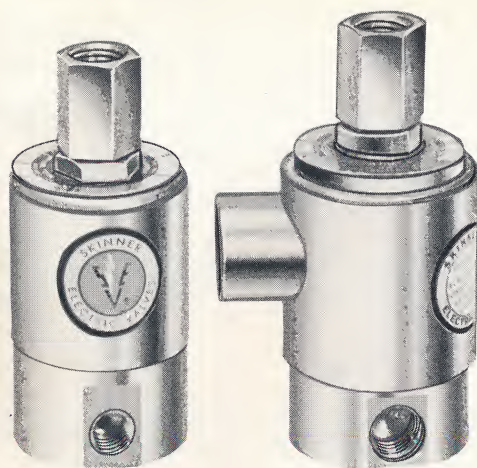
1/16-1/16 orifice valves are available. Consult Skinner for pressure rating.

*Higher than standard pressure ratings available. Please consult Skinner.

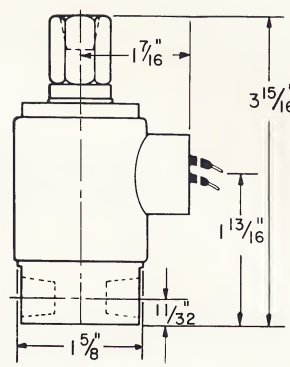
**PTF (Short dryseal thread).

†Price does not include fittings.

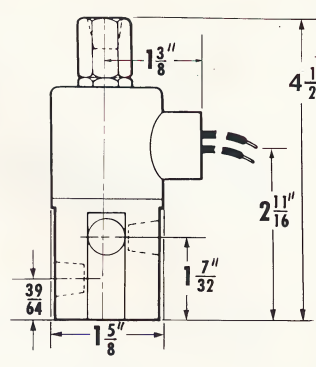
Catalog numbers in color indicate valves carried in Factory Stock. Catalog numbers followed by a dagger (†) indicate valves stocked nationwide by Skinner Stocking Distributors.



Types V53, V54,
V55, V56



Types X53, X54,
X55, X56



Type Q5

THREE-WAY STAINLESS STEEL SOLENOID VALVES

THREE-WAY V5 SERIES

MATERIAL—Stainless steel body and internal parts.

WEIGHT—From 1.1 to 1.6 lbs.

POWER CONSUMPTION—10 watts maximum.

MEDIA—Air, inert gases, vacuum, hydraulic fluids, petroleum products, water, freons, and many semicorrosive media. Water applications, continuously energized (over 1½ hours) air applications and some petroleum products applications normally require plunger assembly insert modification.

PRICES SHOWN FOR 115/60, 230/60 AC, 6V, 12V DC, 24/50, 115/50, 250/50 AC

*MAXIMUM OPERATING PRESSURE DIFFERENTIAL (PSI)		ORIFICE DIA.				GROMMET HOUSING OPTION ES			1/4" NPT CONDUIT HOUSING OPTION EC			EXPLOSION-PROOF CONSTRUCTION 1/2" NPT CONDUIT		
		INLET PORT	C _v	EX- HAUST PORT	C _v	CATALOG NO.		LIST PRICE	CATALOG NO.		LIST PRICE	CATALOG NO.		LIST PRICE
						1/8" NPT.	1/4" NPT		1/8" NPT	1/4" NPT		1/8" NPT	1/4" NPT	
AC	DC													
THREE-WAY NORMALLY CLOSED, TYPE V53 STANDARD TYPE X53 EXPLOSION PROOF														
150	150	3/64	.052	1/16	.095	V53DA1150	V53DA2150	\$13.00	V53DB1150	V53DB2150†	\$13.50	X53DB1150	X53DB2150	\$19.25
100	100	1/16	.095	1/16	.095	V53DA1100	V53DA2100	13.00	V53DB1100	V53DB2100†	13.50	X53DB1100	X53DB2100†	19.25
75	75	3/32	.166	3/32	.166	V53DA1075	V53DA2075	13.00	V53DB1075	V53DB2075	13.50	X53DB1075	X53DB2075	19.25
50	50	1/8	.280	3/32	.166	V53DA1050	V53DA2050	13.00	V53DB1050	V53DB2050†	13.50	X53DB1050	X53DB2050	19.25
20	20	3/16	.500	3/32	.166	V53DA1020	V53DA2020	13.00	V53DB1020	V53DB2020	13.50	X53DB1020	X53DB2020	19.25
Vacuum		1/4	.752	3/32	.166	V53DA1VAC2	V53DA2VAC2	13.00	V53DB1VAC2	V53DB2VAC2	13.50	X53DB1VAC2	X53DB2VAC2	19.25
	5	1/4	.752	3/32	.166	V53DA1006	V53DA2006	13.00	V53DB1006	V53DB2006	13.50	X53DB1006	X53DB2006	19.25
THREE-WAY NORMALLY CLOSED, TYPE V53A STANDARD, X53A EXPLOSION PROOF EXHAUST TO ATMOSPHERE														
150	150	3/64	.052	1/16	.095	V53ADA1150	V53ADA2150	\$12.25	V53ADB1150	V53ADB2150	\$12.75	X53ADB1150	X53ADB2150	\$18.50
100	100	1/16	.095	1/16	.095	V53ADA1100	V53ADA2100	12.25	V53ADB1100	V53ADB2100†	12.75	X53ADB1100	X53ADB2100†	18.50
75	75	3/32	.166	3/32	.166	V53ADA1075	V53ADA2075	12.25	V53ADB1075	V53ADB2075	12.75	X53ADB1075	X53ADB2075	18.50
50	50	1/8	.280	3/32	.166	V53ADA1050	V53ADA2050	12.25	V53ADB1050	V53ADB2050	12.75	X53ADB1050	X53ADB2050	18.50
20	20	3/16	.500	3/32	.166	V53ADA1020	V53ADA2020	12.25	V53ADB1020	V53ADB2020	12.75	X53ADB1020	X53ADB2020	18.50
Vacuum		1/4	.752	3/32	.166	V53ADA1VAC2	V53ADA2VAC2	12.25	V53ADB1VAC2	V53ADB2VAC2	12.75	X53ADB1VAC2	X53ADB2VAC2	18.50
	5	1/4	.752	3/32	.166	V53ADA1006	V53ADA2006	12.25	V53ADB1006	V53ADB2006	12.75	X53ADB1006	X53ADB2006	18.50
THREE-WAY NORMALLY CLOSED, TYPE Q53 QUICK EXHAUST VALVES														
150	150	3/64	.052	3/32	.166	Q53DA1150	Q53DA2150	\$18.50	Q53DB1150	Q53DB2150	\$19.00	NOT AVAILABLE		
100	100	1/16	.095	Plus	Plus	Q53DA1100	Q53DA2100	18.50	Q53DB1100	Q53DB2100	19.00			
75	75	3/32	.166	1/8	.245	Q53DA1075	Q53DA2075	18.50	Q53DB1075	Q53DB2075	19.00			
50	50	1/8	.280	Exhaust		Q53DA1050	Q53DA2050	18.50	Q53DB1050	Q53DB2050	19.00			
THREE-WAY NORMALLY CLOSED, TYPE Q53A QUICK EXHAUST VALVES—EXHAUST TO ATMOSPHERE														
150	150	3/64	.052	3/32	.166	Q53ADA1150	Q53ADA2150	\$17.75	Q53ADB1150	Q53ADB2150	\$18.25	NOT AVAILABLE		
100	100	1/16	.095	Plus	Plus	Q53ADA1100	Q53ADA2100	17.75	Q53ADB1100	Q53ADB2100†	18.25			
75	75	3/32	.166	1/8	.245	Q53ADA1075	Q53ADA2075	17.75	Q53ADB1075	Q53ADB2075	18.25			
50	50	1/8	.280	Exhaust		Q53ADA1050	Q53ADA2050	17.75	Q53ADB1050	Q53ADB2050	18.25			

Catalog numbers in color indicate valves carried in Factory Stock. Catalog numbers followed by a dagger (†) indicate valves stocked nationwide by Skinner Stocking Distributors.

*Higher than standard pressure ratings are available. Please consult Skinner.

THREE-WAY STAINLESS STEEL SOLENOID VALVES (cont'd)

THREE-WAY V5 SERIES

PRICES SHOWN FOR 115/60, 230/60 AC, 6V, 12V DC, 24/50, 115/50, 250/50 AC

* MAXIMUM OPERATING PRESSURE DIFFERENTIAL (PSI)		ORIFICE DIAMETER (inches)				GROMMET HOUSING OPTION ES			½" NPT CONDUIT HOUSING OPTION EC			EXPLOSION-PROOF CONSTRUCTION ½" NPT CONDUIT		
		INLET PORT	Cv FACTOR	EX- HAUST	Cv FACTOR	CATALOG NO.		LIST PRICE	CATALOG NO.		LIST PRICE	CATALOG NO.		LIST PRICE
						⅛" NPT	¼" NPT		⅛" NPT	¼" NPT		⅛" NPT	¼" NPT	
AC	DC													
THREE-WAY MULTI-PURPOSE, TYPE V54 STANDARD, TYPE X54 EXPLOSION PROOF														
400	400	⅓ ₃₂	.024	⅓ ₃₂	.024	V54DA1400	V54DA2400	\$18.75	V54DB1400	V54DB2400	\$19.25	X54DB1400	X54DB2400	\$25.00
150	150	⅓ ₆₄	.052	⅓ ₆₄	.052	V54DA1150	V54DA2150	13.75	V54DB1150	V54DB2150	14.25	X54DB1150	X54DB2150	20.00
100	100	⅓ ₁₆	.095	⅓ ₁₆	.095	V54DA1100	V54DA2100	13.75	V54DB1100	V54DB2100	14.25	X54DB1100	X54DB2100	20.00
75	75	⅓ ₃₂	.166	⅓ ₃₂	.166	V54DA1075	V54DA2075	13.75	V54DB1075	V54DB2075	14.25	X54DB1075	X54DB2075	20.00
THREE-WAY NORMALLY OPEN, TYPE V55 STANDARD, TYPE X55 EXPLOSION PROOF														
150	150	⅓ ₆₄	.052	⅓ ₁₆	.095	V55DA1150	V55DA2150	\$13.00	V55DB1150	V55DB2150	\$13.50	X55DB1150	X55DB2150	\$19.25
100	100	⅓ ₁₆	.095	⅓ ₈	.280	V55DA1100	V55DA2100	13.00	V55DB1100	V55DB2100†	13.50	X55DB1100	X55DB2100	19.25
75	75	⅓ ₃₂	.166	⅓ ₈	.280	V55DA1075	V55DA2075	13.00	V55DB1075	V55DB2075	13.50	X55DB1075	X55DB2075	19.25
THREE-WAY DIRECTIONAL CONTROL, TYPE V56 STANDARD, TYPE X56 EXPLOSION PROOF														
200	200	⅓ ₁₆	.095	⅓ ₆₄	.052	V56DA1200	V56DA2200	\$13.00	V56DB1200	V56DB2200	\$13.50	X56DB1200	X56DB2200	\$19.25
150	150	⅓ ₁₆	.095	⅓ ₁₆	.095	V56DA1150	V56DA2150	13.00	V56DB1150	V56DB2150	13.50	X56DB1150	X56DB2150	19.25
125	125	⅓ ₃₂	.166	⅓ ₃₂	.166	V56DA1125	V56DA2125	13.00	V56DB1125	V56DB2125	13.50	X56DB1125	X56DB2125	19.25
100	100	⅓ ₈	.280	⅓ ₃₂	.166	V56DA1100	V56DA2100	13.00	V56DB1100	V56DB2100	13.50	X56DB1100	X56DB2100	19.25

THREE-WAY MEDIUM SIZE SOLENOID VALVES

MATERIAL—Die-cast zinc body and stainless steel internal parts.

WEIGHT—2.5 lbs.

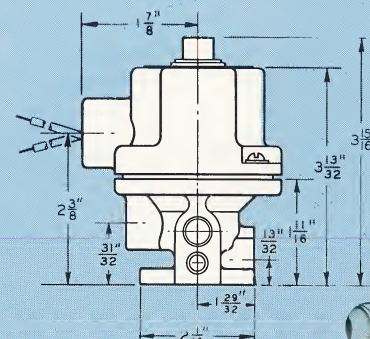
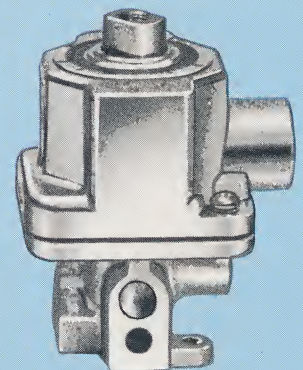
POWER CONSUMPTION—16 watt maximum AC, 15 watt maximum DC.

MEDIA—Air, oil, inert gases, and vacuum. Continuously energized (over 1½ hours) air applications normally require plunger assembly insert modification.

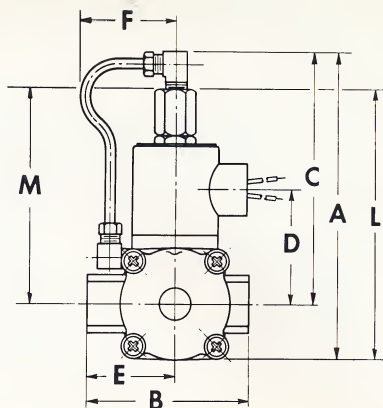
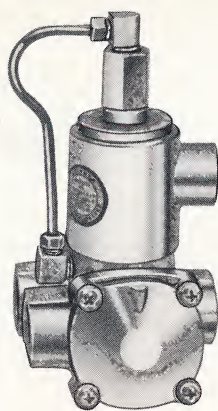
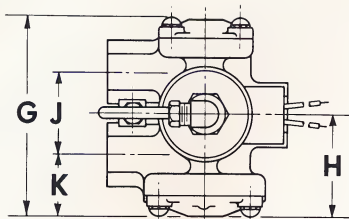
PRICES SHOWN FOR 115/60, 230/60 AC, 6V, 12V DC, 115/50, 230/50 AC

MAXIMUM OPERATING PRESSURE DIFFERENTIAL (PSI)		ORIFICE DIAMETER (inches)			BODYPORT PIPE SIZE NPTF (inches)*	½" NPT CONDUIT OPTION EC	
AC	DC	NORMALLY CLOSED	NORMALLY OPEN	Cv FACTOR		CATALOG NO.	LIST PRICE
THREE-WAY NORMALLY CLOSED TYPE A3							
250	250	3/32	3/32	.210	¼	A3DB2252	\$19.00
		3/32	3/32	.210	¼	A36DB2251	19.00
175	175	1/8	1/8	.350	¼	A3DB2177	19.00
		1/8	1/8	.350	¼	A36DB2176	19.00
125	125	5/32	5/32	.454	¼	A3DB2127†	19.00
		5/32	5/32	.454	¼	A36DB2126	19.00
THREE-WAY MULTI-PURPOSE TYPE A4							
150	150	3/32	3/32	.210	¼	A4DB2152	\$22.00
		3/32	3/32	.210	¼	A46DB2151	20.00
100	100	1/8	1/8	.350	¼	A4DB2102	22.00
		1/8	1/8	.350	¼	A46DB2101	20.00
75	75	5/32	5/32	.454	¼	A4DB2077	22.00
		5/32	5/32	.454	¼	A46DB2076	20.00
THREE-WAY NORMALLY OPEN TYPE A5							
250	250	3/32	3/32	.210	¼	A5DB2252	\$21.00
		3/32	3/32	.210	¼	A56DB2251	19.00
175	175	1/8	1/8	.350	¼	A5DB2177	21.00
		1/8	1/8	.350	¼	A56DB2176	19.00
125	125	5/32	5/32	.454	¼	A5DB2127†	21.00
		5/32	5/32	.454	¼	A56DB2126	19.00
THREE-WAY DIRECTIONAL CONTROL TYPE A6							
250	250	3/32	3/32	.210	¼	A6DB2252	\$21.00
		3/32	3/32	.210	¼	A66DB2251	21.00
175	175	1/8	1/8	.350	¼	A6DB2177	21.00
		1/8	1/8	.350	¼	A66DB2176	21.00
125	125	5/32	5/32	.454	¼	A6DB2127	21.00
		5/32	5/32	.454	¼	A66DB2126	21.00

THREE-WAY A SERIES



Catalog numbers in color indicate valves carried in Factory Stock. Catalog numbers followed by a dagger (†) indicate valves stocked nationwide by Skinner Stocking Distributors.



THREE-WAY HIGH-FLOW SOLENOID VALVES

THREE-WAY L SERIES

	A	B	C	D	E	F	G	H	J	K
LP ³ / ₈	5 ¹¹ / ₃₂	2 ⁷ / ₈	4 ¹³ / ₃₂	1 ¹⁵ / ₁₆	1 ⁷ / ₁₆	1 ²⁷ / ₃₂	2 ³¹ / ₃₂	1 ¹ / ₂	1 ⁷ / ₃₂	2 ⁹ / ₃₂
LP ¹ / ₂	5 ⁵ / ₈	3 ³ / ₃₂	4 ⁹ / ₁₆	2 ³ / ₃₂	1 ²¹ / ₃₂	1 ²⁷ / ₃₂	3 ³ / ₈	1 ³ / ₄	1 ¹³ / ₃₂	1 ¹ / ₁₆
LP ³ / ₄	6 ¹ / ₂	3 ³ / ₈	4 ³ / ₄	2 ¹¹ / ₃₂	1 ¹¹ / ₁₆	1 ²⁷ / ₃₂	4 ⁷ / ₃₂	2 ¹ / ₄	1 ²³ / ₃₂	1 ²⁵ / ₆₄
XLP ³ / ₈	5 ⁵ / ₈	2 ⁵ / ₈	4 ²³ / ₃₂	2 ¹ / ₁₆	1 ⁷ / ₁₆	1 ²⁷ / ₃₂	2 ³¹ / ₃₂	1 ¹ / ₂	1 ⁷ / ₃₂	2 ⁹ / ₃₂
XLP ¹ / ₂	5 ²⁹ / ₃₂	3 ³ / ₃₂	4 ²⁷ / ₃₂	2 ⁷ / ₃₂	1 ²¹ / ₃₂	1 ²⁷ / ₃₂	3 ³ / ₈	1 ³ / ₄	1 ¹³ / ₃₂	1 ¹ / ₁₆
XLP ³ / ₄	6 ²⁵ / ₃₂	3 ³ / ₈	5 ¹ / ₃₂	2 ¹⁵ / ₃₂	1 ¹¹ / ₁₆	1 ²⁷ / ₃₂	4 ⁷ / ₃₂	2 ¹ / ₄	1 ²³ / ₃₂	1 ²⁵ / ₆₄

MATERIAL—Forged naval brass body and stainless steel internal parts.

WEIGHT—From 2.6 to 5.4 lbs.

POWER CONSUMPTION—10 watts maximum.

MEDIA—Air, oil, water, inert gases, and other common media. Water applications or continuously energized (over 1½ hrs) air application normally require pilot plunger assembly insert modification.

PRICES SHOWN FOR 115/60, 230/60 AC, 6V, 12V DC, 24/50, 115/50, 250/50 AC

* OPERATING PRESSURE DIFFERENTIAL (PSI) AC AND DC		ORIFICE DIA. (inches)	PIPE SIZE NPTF (inches)	Cv FACTOR	GROMMET HOUSING OPTION ES		½" NPT CONDUIT HOUSING OPTION EC		EXPLOSION-PROOF CONSTRUCTION ½" NPT CONDUIT HOUSING	
MAXIMUM	MINIMUM				CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE
THREE-WAY NORMALLY CLOSED, TYPE LP3 STANDARD, TYPE XLP3 EXPLOSION PROOF										
150	10	⅜	⅜	2.06	LP3DA3150	\$37.25	LP3DB3150†	\$37.75	XLP3DB3150	\$43.50
150	10	½	½	3.65	LP3DA4150	41.50	LP3DB4150†	42.00	XLP3DB4150	48.00
150	5	¾	¾	7.30	LP3DA5150	56.25	LP3DB5150†	56.75	XLP3DB5150	62.50
THREE-WAY NORMALLY OPEN, TYPE LP5 STANDARD, TYPE XLP5 EXPLOSION PROOF										
150	10	⅜	⅜	2.06	LP5DA3150	\$37.25	LP5DB3150	\$37.75	XLP5DB3150	\$43.50
150	10	½	½	3.65	LP5DA4150	41.50	LP5DB4150†	42.00	XLP5DB4150	48.00
150	5	¾	¾	7.30	LP5DA5150	56.25	LP5DB5150†	56.75	XLP5DB5150	62.50
THREE-WAY DIRECTIONAL CONTROL, TYPE L6 STANDARD, TYPE XL6 EXPLOSION PROOF										
150	10	⅜	⅜	2.06	L6DA3150	\$34.50	L6DB3150	\$35.00	XL6DB3150	\$40.75
150	10	½	½	3.65	L6DA4150	38.75	L6DB4150	39.25	XL6DB4150	45.25
150	5	¾	¾	7.30	L6DA5150	53.50	L6DB5150	54.00	XL6DB5150	59.75

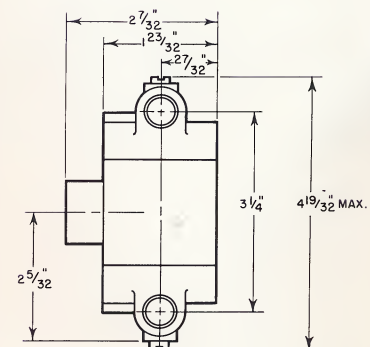
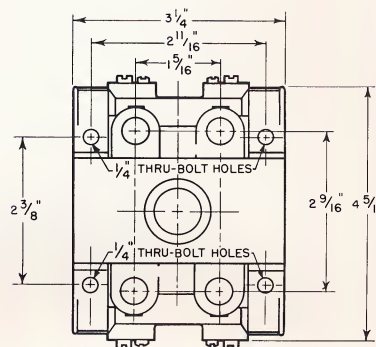
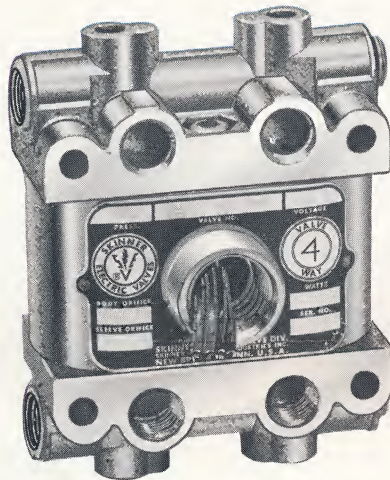
NOTE: All the L Series, three-way valves listed here are supplied with a piped pilot return. If application will permit pilot to exhaust to atmosphere, order valve without piped return by eliminating the P in Catalog Number (example LP3DA3150 becomes L3DA3150) and reduce list price by \$2.75. Directional control valves are not available with piped return.

Catalog numbers in color indicate valves carried in Factory Stock. Catalog numbers followed by a dagger (†) indicate valves stocked nationwide by Skinner Stocking Distributors.

*Higher than standard pressure ratings are available. Please consult Skinner.

COMPACT, ALL-PURPOSE FOUR-WAY SOLENOID VALVES

FOUR-WAY V9 SERIES



MATERIAL—Die-cast zinc body with stainless steel internal parts.

WEIGHT—2.8 lbs.

POWER CONSUMPTION—10 watts maximum per coil (2 coils per valve).

MEDIA—Air, hydraulic oils, and inert gases. Continuously energized (over 1½ hours) air application normally requires plunger assembly insert modification.

PIPE SIZE—¼" NPT

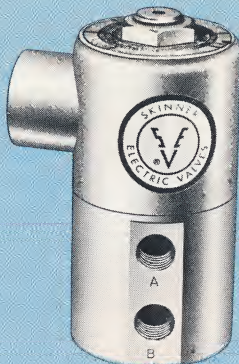
PRICES SHOWN FOR 115/60, 230/60 AC, 6V, 12V DC, 24/50, 115/50, 250/50 AC

*MAXIMUM OPERATING PRESSURE DIFFERENTIAL (PSI)	ORIFICE DIAMETER (inch)								WITH NO ADJUSTABLE FLOW		ADJUSTABLE FLOW AT BOTH INLET AND EXHAUST		ADJUSTABLE FLOW ON BOTH EXHAUST PORTS		ADJUSTABLE FLOW ON BOTH INLET PORTS	
	VALVE NO. 1				VALVE NO. 2											
	Inlet Port	Cv Factor	Ex- haust Port	Cv Factor	Inlet Port	Cv Factor	Ex- haust Port	Cv Factor	CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE
FOUR-WAY NORMALLY CLOSED-NORMALLY CLOSED NEUTRAL POSITION VALVES, TYPE V933																
150	3⁄64	.052	1⁄16	.095	3⁄64	.052	1⁄16	.095	V933DB2150	\$24.75	V933DEF2150	\$32.75	V933DEH2150	\$28.75	V933DEP2150	\$28.75
100	1⁄16	.095	3⁄32	.156	1⁄16	.095	3⁄32	.156	V933DB2100	24.75	V933DEF2100	32.75	V933DEH2100	28.75	V933DEP2100	28.75
75	3⁄32	.156	3⁄32	.156	3⁄32	.156	3⁄32	.156	V933DB2075	24.75	V933DEF2075	32.75	V933DEH2075	28.75	V933DEP2075	28.75
50	1⁄8	.214	3⁄32	.156	1⁄8	.214	3⁄32	.156	V933DB2050	24.75	V933DEF2050	32.75	V933DEH2050	28.75	V933DEP2050	28.75
FOUR-WAY NORMALLY CLOSED-NORMALLY OPEN NO NEUTRAL POSITION VALVES, TYPE V935																
150	3⁄64	.052	1⁄16	.095	3⁄64	.052	1⁄16	.095	V935DB2150	\$24.75	V935DEF2150	\$32.75	V935DEH2150	\$28.75	V935DEP2150	\$28.75
100	1⁄16	.095	3⁄32	.156	1⁄16	.095	1⁄8	.214	V935DB2100	24.75	V935DEF2100	32.75	V935DEH2100	28.75	V935DEP2100	28.75
75	3⁄32	.156	3⁄32	.156	3⁄32	.156	1⁄8	.214	V935DB2075	24.75	V935DEF2075	32.75	V935DEH2075	28.75	V935DEP2075	28.75
50	1⁄8	.214	3⁄32	.156	3⁄32	.156	1⁄8	.214	V935DB2050	24.75	V935DEF2050	32.75	V935DEH2050	28.75	V935DEP2050	28.75
FOUR-WAY NORMALLY OPEN-NORMALLY OPEN NEUTRAL POSITION VALVES, TYPE V955																
150	3⁄64	.052	1⁄16	.095	3⁄64	.052	1⁄16	.095	V955DB2150	\$24.75	V955DEF2150	\$32.75	V955DEH2150	\$28.75	V955DEP2150	\$28.75
100	1⁄16	.095	1⁄8	.214	1⁄16	.095	1⁄8	.214	V955DB2100	24.75	V955DEF2100	32.75	V955DEH2100	28.75	V955DEP2100	28.75
75	3⁄32	.156	1⁄8	.214	3⁄32	.156	1⁄8	.214	V955DB2075	24.75	V955DEF2075	32.75	V955DEH2075	28.75	V955DEP2075	28.75

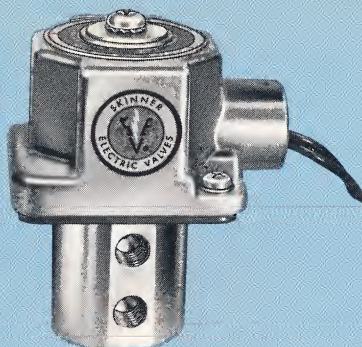
NOTE: Reversed housing, with ½" NPT conduit, also available. Please consult Skinner.

Catalog numbers in color indicate valves carried in Factory Stock. Catalog numbers followed by a dagger (†) indicate valves stocked nationwide by Skinner Stocking Distributors.

*Higher than standard pressure ratings are available. Please consult Skinner.



V10 SERIES



A10 SERIES



X10 SERIES

TWO- AND THREE-WAY HIGH-PRESSURE HYDRAULIC SOLENOID VALVES

MATERIAL—Stainless steel body and internal parts.

WEIGHT—V10 1.5 lbs., X10 2.0 lbs., A10 2.7 lbs.

POWER CONSUMPTION—V10, X10, 10 watts maximum; A10, 16 watts maximum.

MEDIA—Hydraulic fluids only.

PIPE SIZE— $\frac{1}{8}$ " NPT.

PRICES SHOWN FOR 115/60, 230/60, 6V, 12V DC, 115/50, 250/50 AC

TWO- AND THREE-WAY X10 A10 V10 SERIES

STATIC PRESSURE RATING (PSI)		EFFECTIVE ORIFICE DIA. (inch)	Cv FACTOR	MAXIMUM FLOW* GPM	MAXIMUM PRESSURE DIFFERENTIAL PSI*	GROMMET HOUSING OPTION ES		½" NPT CONDUIT HOUSING OPTION EC		EXPLOSION-PROOF CONSTRUCTION ½" NPT CONDUIT	
AC	DC					CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE	CATALOG NO.	LIST PRICE
TWO-WAY NORMALLY OPEN, TYPES V11, A11, ALL STANDARD, TYPE X11 EXPLOSION PROOF											
1000	1000	.109	.210	6.5	900	V11DA11002	\$31.00	V11DB11002	\$31.50	X11DB11002	\$47.75
		.109	.210	6.5	900	V116DA11001	31.00	V116DB11001	31.50	X116DB11001	47.75
3000	3000	.090	.155	9.0	3000	NOT AVAILABLE		A11DB13002	51.00	NOT AVAILABLE	
		.090	.155	9.0	3000	NOT AVAILABLE		A116DB13001	51.00	NOT AVAILABLE	
TWO-WAY NORMALLY CLOSED, TYPES V12, A12, A12 STANDARD, TYPE X12 EXPLOSION PROOF											
1000	1000	.109	.210	5.7	700	V12DA11002	\$31.00	V12DB11002	\$31.50	X12DB11002	47.75
		.109	.210	5.7	700	V126DA11001	31.00	V126DB11001	31.50	X126DB11001	47.75
3000	3000	.090	.155	8.5	3000	NOT AVAILABLE		A12DB13002	51.00	NOT AVAILABLE	
		.090	.155	8.5	3000	NOT AVAILABLE		A126DB13001	51.00	NOT AVAILABLE	
THREE-WAY NORMALLY CLOSED, TYPES V13, A13 STANDARD, TYPE X13 EXPLOSION PROOF											
1000	1000	.109	.210	5.7	700	V13DA11002	\$31.00	V13DB11002	\$31.50	X13DB11002	\$47.75
		.109	.210	5.7	700	V136DA11001	31.00	V136DB11001	31.50	X136DB11001	47.75
3000	3000	.090	.155	5.7	1000	NOT AVAILABLE		A13DB13002	51.00	NOT AVAILABLE	
		.090	.155	5.7	1000	NOT AVAILABLE		A136DB13001	51.00	NOT AVAILABLE	
THREE-WAY NORMALLY OPEN, TYPES V15, A15 STANDARD, TYPE X15 EXPLOSION PROOF											
1000	1000	.109	.210	3.5	450	V15DA11002	\$31.00	V15DB11002	\$31.50	X15DB11002	\$47.75
		.109	.210	3.5	450	V156DA11001	31.00	V156DB11001	31.50	X156DB11001	47.75
3000	3000	.090	.155	8.5	3000	NOT AVAILABLE		A15DB13002	51.00	NOT AVAILABLE	
		.090	.155	8.5	3000	NOT AVAILABLE		A156DB13001	51.00	NOT AVAILABLE	
THREE-WAY DIRECTIONAL CONTROL, TYPES V16, A16 STANDARD, TYPE X16 EXPLOSION PROOF											
1000	1000	.109	.210	2.5	150	V16DA11002	\$31.00	V16DB11002	\$31.50	X16DB11002	\$47.75
		.109	.210	2.5	150	V166DA11001	31.00	V166DB11001	31.50	X166DB11001	47.75
3000	3000	.090	.155	7.0	2000	NOT AVAILABLE		A16DB13002	51.00	NOT AVAILABLE	
		.090	.155	7.0	2000	NOT AVAILABLE		A166DB13001	51.00	NOT AVAILABLE	
THREE-WAY DUAL PURPOSE NORMALLY OPEN AND NORMALLY CLOSED, TYPE V18 STANDARD, TYPE X18 EXPLOSION PROOF											
		SEE ABOVE FOR TYPE USED				V18DA11002	\$31.00	V18DB11002†	\$31.50	X18DB11002	\$47.75
		SEE ABOVE FOR TYPE USED				V186DA11001	31.00	V186DB11001	31.50	X186DB11001	47.75

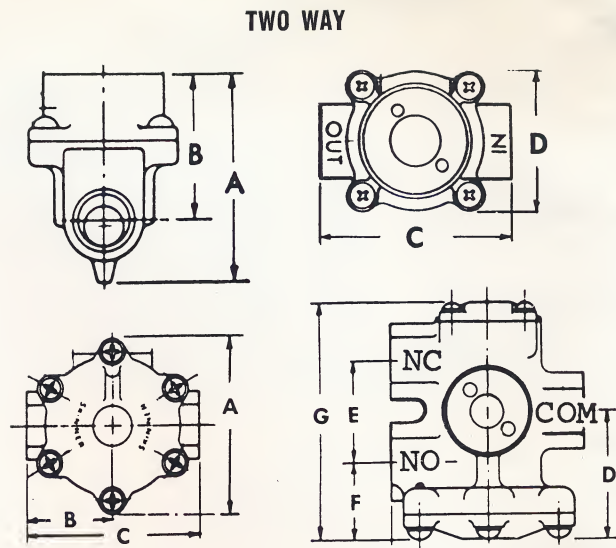
*Higher maximum pressure differential and maximum flow ratings are possible under certain conditions. Consult Skinner.

Catalog numbers in color indicate valves carried in Factory Stock. Catalog numbers followed by a dagger (†) indicate valves stocked nationwide by Skinner Stocking Distributors.

TWO AND THREE-WAY REMOTE CONTROL VALVES

LR SERIES

Two- and three-way remote control valves are for use with separate pilots. The two-way valves may be used as normally open or normally closed, depending on hookup. The three-way valves may be used normally open, normally closed or directional control, depending on hookup. These valves are very similar in construction to the Skinner L series valves but without a solenoid operator.



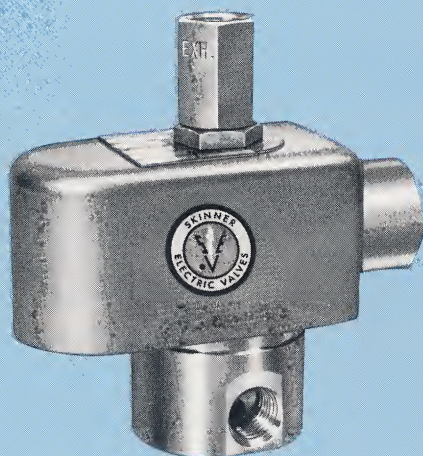
THREE WAY

MATERIAL—Forged brass body and brass internal parts.

MEDIA—Air, oil, water, inert gases and other common media.

ORIFICE DIA. (inches)	PIPE SIZE NPT	Cv FACTOR	WEIGHT (lbs.)	D I M E N S I O N S							CATALOG NO.	LIST PRICE
				A	B	C	D	E	F	G		
2-WAY												
1/2	3/8	2.42	1.65	2 ²³ / ₃₂	2 ¹ / ₁₆	2 ³ / ₄	2				LR1XX3180	\$23.00
1/2	1/2	2.81	1.65	2 ²³ / ₃₂	2 ¹ / ₁₆	2 ³ / ₄	2				LR1XX4180	23.00
3/4	3/4	7.32	3.9	4 ¹ / ₁₆	2 ⁷ / ₈	3 ⁵ / ₈	3 ³ / ₃₂				LR1XX5180	35.25
1	1	11.00	5.4	4 ¹⁵ / ₃₂	3 ⁵ / ₃₂	4 ⁵ / ₁₆	3 ¹⁵ / ₃₂				LR1XX6180	57.75
3-WAY												
3/8	3/8	2.06	1.8	2 ⁷ / ₃₂	1 ⁷ / ₁₆	2 ⁵ / ₈	1 1/2	1 ⁷ / ₃₂	2 ⁹ / ₃₂	2 ³¹ / ₃₂	LR4XX3180	31.50
1/2	1/2	3.65	2.5	2 ⁹ / ₁₆	1 ²¹ / ₃₂	3 ³ / ₃₂	1 3/4	1 ¹³ / ₃₂	1 1/16	3 3/8	LR4XX4180	35.75
3/4	3/4	7.30	4.3	3 ¹⁵ / ₃₂	1 ¹¹ / ₁₆	3 ³ / ₈	2 1/4	1 ²³ / ₃₂	1 ²⁵ / ₆₄	4 ⁷ / ₃₂	LR4XX5180	44.75

MAGNELATCH^(TM) OPTION



The MagneLatch Option permits valves with which it is equipped to operate by means of a permanent magnet latch circuit that can be controlled by a momentary pulse of 20 milliseconds or by continuous current flow. Unlike a conventional solenoid valve, which requires a continuous flow of current through a coil to hold the plunger in one position, MagneLatch valves require **only** the momentary pulse.

Because of their low current drain and resultant lack of heat buildup, MagneLatch valves are ideal for direct application in (flip-flop) logic circuitry; instrumentation; portable and remote control equipment used with battery packs and such other applications as medical equipment, machine tools, transportation products and materials handling equipment.

The MagneLatch Option is available on the following valves:

Two-Way V5 Series

Two-Way R Series

Two-Way L Series

Three-Way V5 Series

Three-Way L Series

Two and Three-Way V10 Series

FLOW CONTROL, NEEDLE AND CHECK VALVES

These high quality Skinner valves are designed for use in fluid power control applications. They are available in steel or brass in sizes listed below. Flow control valves are a combination of a check valve to provide

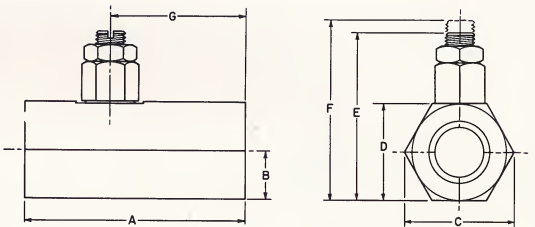
unrestricted flow in one direction and a needle valve to provide metered flow in the opposite direction. The needle provides a wide range of precise adjustments. All valves are of a "flow-through" design.

FLOW CONTROL VALVES

PIPE SIZE NPTF	ORIFICE NEEDLE	DIAMETER (inches) CHECK	Cv FACTOR		TOTAL Cv FACTOR	CATALOG NO. BRASS	LIST PRICE	CATALOG NO. STEEL	LIST PRICE
			NEEDLE	CHECK					
1/8"	.109	.147	.180	.480	.530	F111-200	\$3.65	•	•
1/4"	.156	.219	.360	.860	.860	F121-200	5.00	F124-200	\$5.75
3/8"	.234	.265	.650	1.35	1.50	F131-200	6.55	F134-200	7.55
1/2"	.279	.328	1.15	1.75	2.35	F141-200	9.00	F144-200	9.35
3/4"	.359	.406	1.60	3.00	3.80	F151-200	12.50	F154-200	12.70

• Not Available.

DIMENSIONS (inches)							
CATALOG NO.	A	B	C	D	E	F	G
F111-200	1 7/8	1 1/32	5 1/64	1 1/16	1 5/16	1 33/64	6 1/64
F121-200, F124-200	2 1/16	7/16	1	7/8	1 21/32	1 7/8	1 1/4
F131-200, F134-200	2 15/32	17/32	1 15/64	1 1/16	1 61/64	2 13/32	1 1/2
F141-200, F144-200	3 3/32	2 1/32	1 33/64	1 5/16	2 29/64	2 25/32	1 63/64
F151-200, F154-200	3 17/32	1 3/16	1 7/8	1 5/8	2 7/8	3 3/32	2 13/64

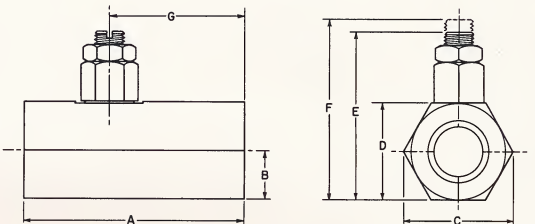


NEEDLE VALVES

PIPE SIZE NPTF	ORIFICE DIAMETER	Cv FACTOR	CATALOG NO. BRASS	LIST PRICE	CATALOG NO. STEEL	LIST PRICE
1/8"	.109	.180	F211-000	\$3.30	•	•
1/4"	.156	.360	F221-000	4.60	F224-000	\$5.45
3/8"	.234	.650	F231-000	6.60	F234-000	7.25
1/2"	.279	1.15	F241-000	8.65	F244-000	9.05
3/4"	.359	1.60	F251-000	12.00	F254-000	12.40

• Not Available

DIMENSIONS (inches)							
CATALOG NO.	A	B	C	D	E	F	G
F211-000	1 5/8	1 1/32	5 1/64	1 1/16	1 5/16	1 33/64	6 1/64
F221-000, F224-000	2 1/16	7/16	1	7/8	1 21/32	1 7/8	1 1/4
F231-000, F234-000	2 1/8	17/32	1 15/64	1 1/16	1 61/64	2 13/32	1 1/16
F241-000, F244-000	2 5/16	2 1/32	1 33/64	1 5/16	2 29/64	2 25/32	1 9/16
F251-000, F254-000	2 19/32	1 3/16	1 7/8	1 5/8	2 7/8	3 3/32	1 1/4

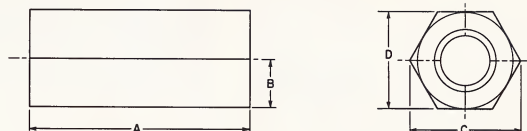


CHECK VALVES

PIPE SIZE NPTF	ORIFICE DIAMETER	Cv FACTOR	CATALOG NO. BRASS	LIST PRICE	CATALOG NO. STEEL	LIST PRICE
1/8"	.147	.480	F311-200	\$2.65	•	•
1/4"	.219	.860	F321-200	4.00	F324-200	\$4.85
3/8"	.265	1.35	F331-200	4.90	F334-200	5.90
1/2"	.328	1.75	F341-200	6.45	F344-200	6.90
3/4"	.406	3.00	F351-200	8.50	F354-200	8.90

• Not Available.

DIMENSIONS (inches)				
CATALOG NO.	A	B	C	D
F311-200	1 5/8	1 1/32	5 1/64	1 1/16
F321-200, F324-200	2 1/16	7/16	1	7/8
F331-200, F334-200	2 1/8	17/32	1 15/64	1 1/16
F341-200, F344-200	2 5/8	2 1/32	1 33/64	1 5/16
F351-200, F354-200	2 7/8	1 3/16	1 7/8	1 5/8



ORDERING INFORMATION

The most popular Skinner Solenoid Valves are listed in this condensed catalog and those that are normally stocked are so indicated. Due to space limitations, information is omitted, and outline dimensional drawings for only a few models are shown. Complete information including specifications, options, comprehensive ordering instructions, etc., is contained in Skinner's General Catalog. You may obtain a copy from your Skinner Distributor or by writing directly to the factory at New Britain, Connecticut. Skinner Representatives and Distributors are listed in the Yellow Pages under "VALVES."

Skinner Valves are sold through authorized representatives and distributors. These men are highly qualified hydraulic and pneumatic specialists and are strategically located throughout the United States and Canada. Stocking Distributors maintain adequate stock of Skinner Valves to assure immediate delivery. Valves stocked nationwide by every Skinner Stocking Distributor are indicated in the catalog listings by reference mark † (dagger). Skinner Representatives and Distributors are listed in the Yellow Pages under "VALVES."

Each Skinner Valve Distributor has been carefully selected and is trained in application engineering to help solve your control problems. In addition, he is backed up by Skinner Field Representatives from coast to coast.

Export Department—Skinner Electric Valve Division, New Britain, Connecticut. U.S.A. Stocking Representatives throughout the free world.

Skinner Solenoid Valves are manufactured under rigid quality controls which use the Underwriters' Laboratories tests as minimum standards. Most Skinner valves are UL and CSA approved.

All prices shown in this catalog are subject to published Trade and Quantity Discounts, and are also subject to change without notice. F.O.B. point: New Britain, Connecticut.

Skinner reserves the right to change design and specifications without notice. All technical data and pricing in this catalog have been checked but we cannot be responsible for any possible errors or omissions that may appear.



THE CREST OF QUALITY

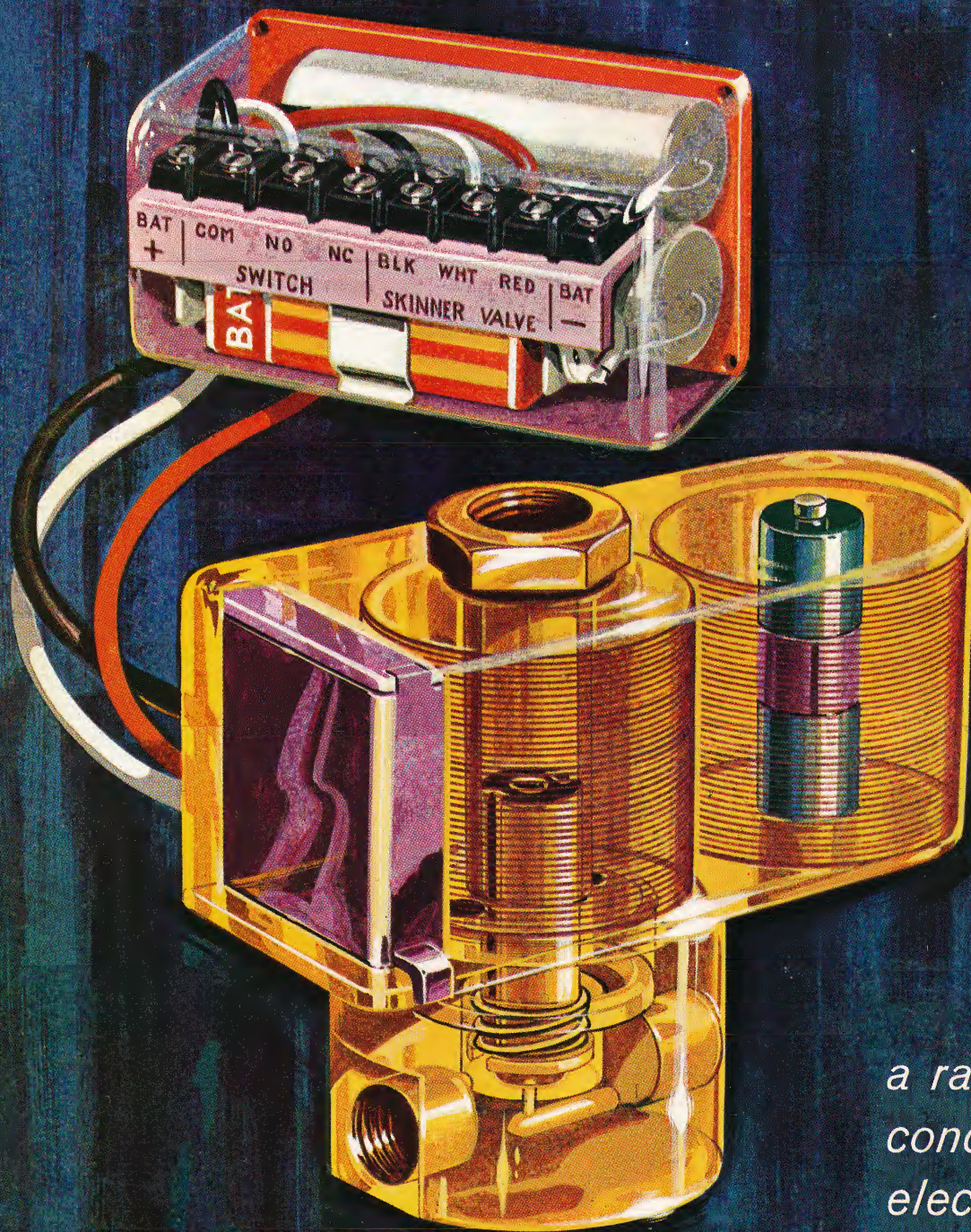
SKINNER ^{ELECTRIC} VALVES

SKINNER ELECTRIC VALVE DIVISION
SKINNER PRECISION INDUSTRIES, INC. • NEW BRITAIN, CONNECTICUT, U.S.A.

SKINNER

MAGNELATCHTM VALVES

*operate on a momentary pulse
with AC, DC, or battery pack*



*a radically new
concept in
electric valves*



What is a Skinner **Magnelatch^(TM)** **Valve?**

A completely new concept in electric valves. The body, sleeve and plunger assembly are identical to the existing Skinner valve line but the operator is physically and electrically different, providing many new features and applications. The valve operates by means of a permanent magnet latch circuit that can be controlled by a momentary current pulse of 20 milliseconds or continuous current flow.

A conventional solenoid valve requires a continuous flow of current through a coil to hold the plunger in one position. The **Magnelatch** valve does not. When in the latch position there is no heat rise and no power consumption. Very low current drain is required due to the small current pulse used to latch and unlatch the valve. In addition, the control circuit has a memory factor requiring a pulse of the opposite polarity to unlatch.

How The Skinner Magnelatch Operates

A conventional solenoid valve is in either one or the other of two positions, a de-energized or "off" position, or an energized "on" position with current flowing through the coil.

The Skinner **Magnelatch** is not a solenoid valve in this respect. As a result, energized and de-energized cannot be used to describe valve position. Positions in these valves are referred to as **Release Position** which is equivalent to the de-energized position and **Latch Position** which is equivalent to the energized position.

APPLICATIONS

The permanent magnet latch valves permit the economical use of electric valves in applications heretofore impossible or impractical. For example:

Solid State Circuitry—Direct application in (flip-flop) logic circuitry.

Instrumentation—No heat build-up—eliminates constant calibrations and permits confinement and compactness. Can be used with such sensors as thermistors and thermocouples.

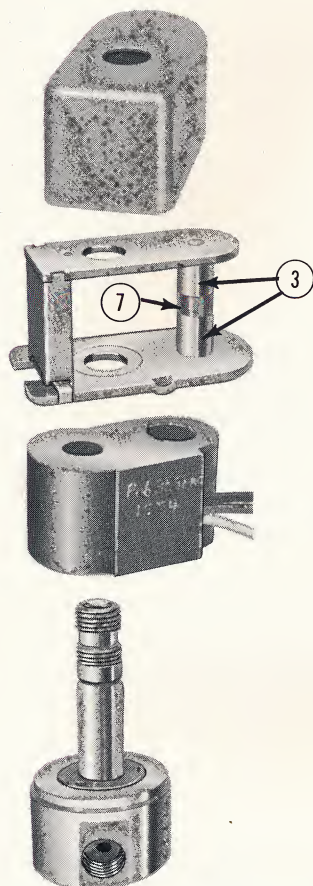
Machine Tools—Operates with simple switches and eliminates holding relays and relayed circuitry required for sequencing and positioning operations.

Portable Equipment—Low current drain permits valve operation on battery packs, making portable equipment practical and economical.

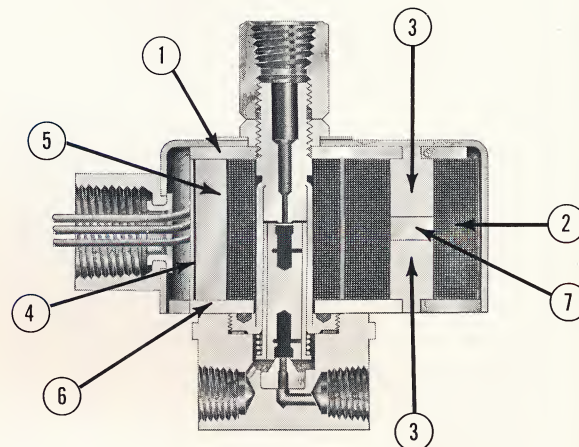
Remote Control Equipment—Pulsing circuitry, low current drain and battery pack operation permit the use of Magnelatch valves in many such operations. Operation can be controlled by radio frequency or mechanical timer, etc.

Many other applications are possible in medical equipment, transportation products, and materials handling equipment.

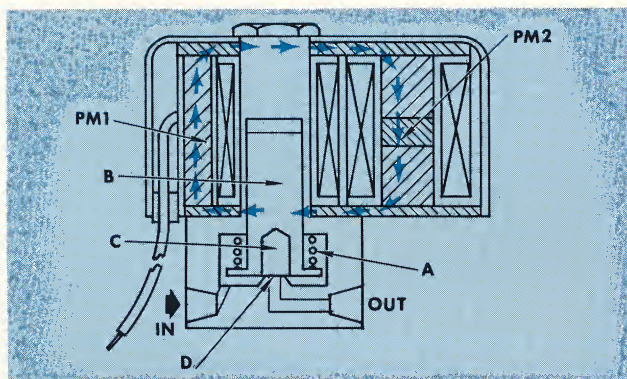
NOMENCLATURE



- ① **Saddle Plate**—Upper flux plate.
- ② **Coil Assembly**—Consists of a main or latch coil C_1 and a switch coil C_2 with necessary circuitry and external leads.
- ③ **Pole Pieces**—Magnetic steel positioners for magnetic switch PM2.
- ④ **Saddle Coupling**—Encases PM1 and ensures proper placement of permanent magnet in flux circuit.
- ⑤ **PM1**—Large permanent magnet used to latch the plunger.
- ⑥ **Sole Plate**—Lower flux plate.
- ⑦ **PM2**—Small permanent magnet the polarity of which can be reversed to properly function the valve.



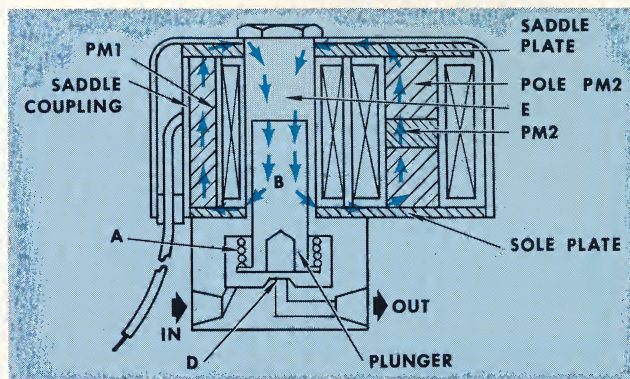
Note: The Magnelatch permanent magnet valve is designed to function on AC and DC current or separate battery pack. Regardless of the input supply, the coil circuit operates on DC (AC is rectified in the coil assembly). The current applied to the coil must be of the opposite polarity of the previous pulse in order for the valve to function.



Release Position

When a two-way normally closed valve is in the Release Position, the force of the plunger spring, A, on the plunger, B, is sufficient to cause the soft synthetic insert, C, to seal the orifice, D, as in any standard Skinner V52 valve.

In this position the magnetic flux generated by PM1 is in phase with the magnetic flux generated by PM2. The plunger magnetic circuit is surrounded by gap which is nonmagnetic and provides a high reluctance path. Following the path of least reluctance, the combined flux of PM1 and PM2 passes through an outer circuit consisting of PM1, saddle plate, PM2 poles, PM2 and sole plate. In this condition the magnetic circuit has no effect on the plunger and the spring force and fluid pressure holds the plunger on the body seat.



Latch Position

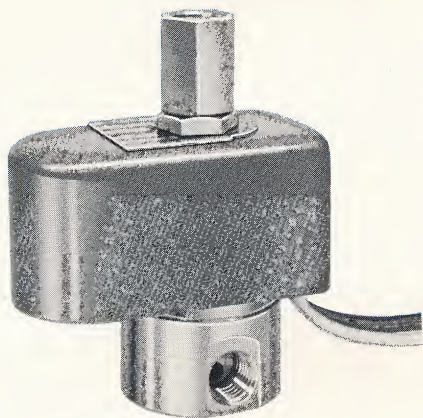
When a momentary pulse of direct current of correct polarity and a duration of approximately 20 milliseconds is triggered to the coil assembly, it causes PM2 to switch its polarity and repel the flux generated by PM1. This action causes the full flux output of PM1 to shunt across the plunger magnetic circuit because this inner circuit now has less reluctance than the outer circuit. When flux travels through the plunger circuit it causes the plunger, B, to move upward against the stop, E, and to open orifice, D, permitting flow through the valve to the OUT port. The magnetic circuit will remain stable and the plunger will remain in this Latch position until a pulse of the opposite polarity is triggered to the coil assembly. No current is required to keep the plunger against the stop.

Skinner Valves Available with Magnelatch™ Option

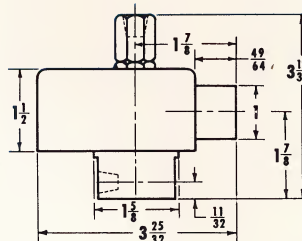
Note: The valve series listed below are those that are presently available with **Magnelatch** Option. It is anticipated that most Skinner General Purpose valves will be available with this option. Please consult Skinner for prices and availability.

A 22½ volt battery pack is available for use with the **Magnelatch** valve. The battery pack can be used up to 5000 cycles, depending on cycle time, before change of battery is required. This package is very sensitive to temperature and the factory should be consulted if other than normal.

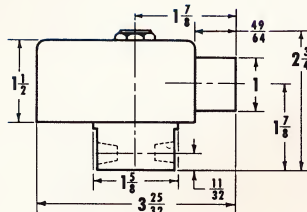
TWO-WAY STAINLESS STEEL ELECTRIC VALVES, V5 SERIES



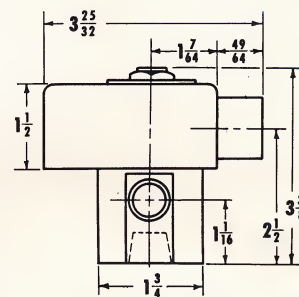
The most versatile line of two-way valves available is now even more versatile with the **Magnelatch** Option. Available normally open, Type V51; normally closed, Types V52, V52H and V52¾, and dual purpose, Type V57.



Type V51

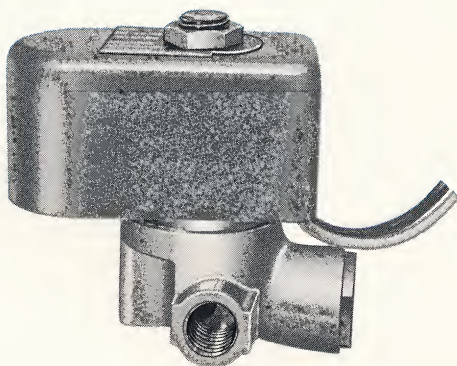


Types V52, V52H, V57

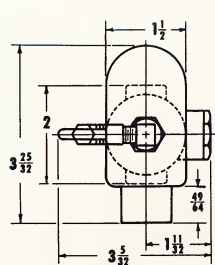


Type V52 ¾

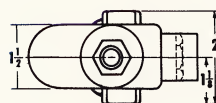
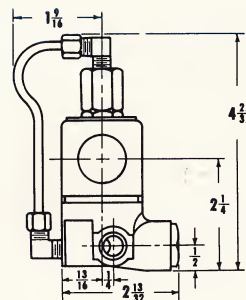
TWO-WAY HIGH PRESSURE PISTON OPERATED ELECTRIC VALVES, R SERIES



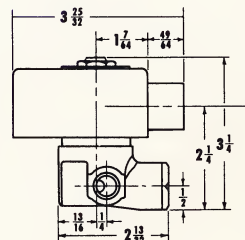
Two-way R Series valves provide high flow capacity and have forged naval brass body and stainless steel internal parts. Valves are available normally open, Type RP1; normally closed, Type R2, and normally closed high pressure, Type R2H.



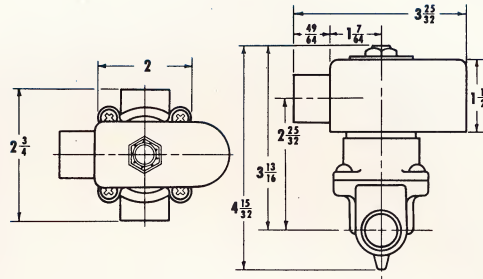
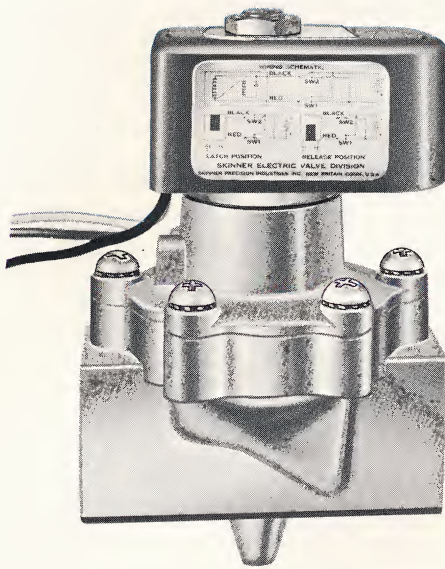
Type RP1



Types R2, R2H



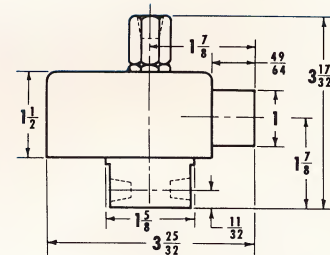
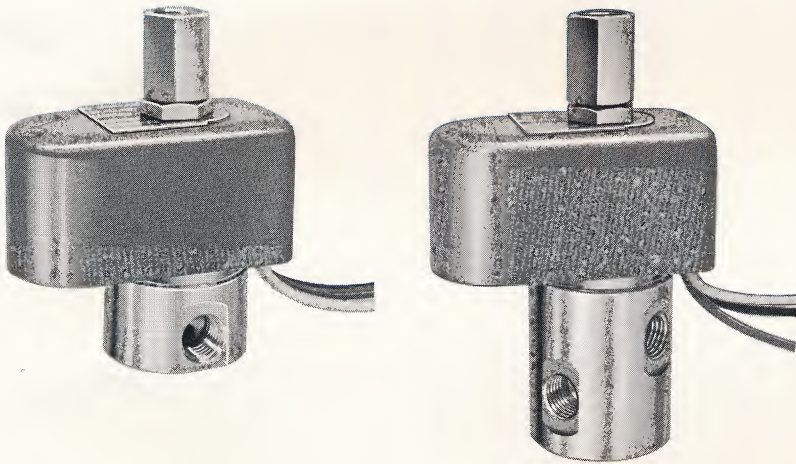
TWO-WAY HIGH FLOW ELECTRIC VALVES, L SERIES



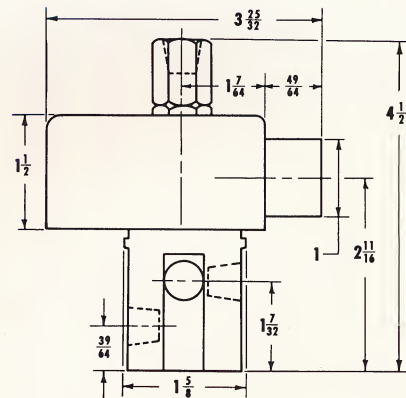
Type L2— $\frac{1}{2}$ " diameter orifice

Two-way L Series valves have high flow capacity yet are compact and modest in cost. These valves are pilot-operated, have a forged naval brass body with brass and stainless steel internal parts. L Series valves are available normally open, Type LP1 or normally closed, Type L2.

THREE-WAY STAINLESS STEEL ELECTRIC VALVES, V5 SERIES



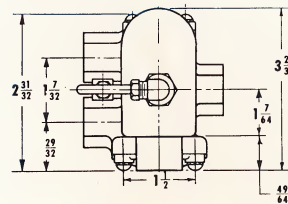
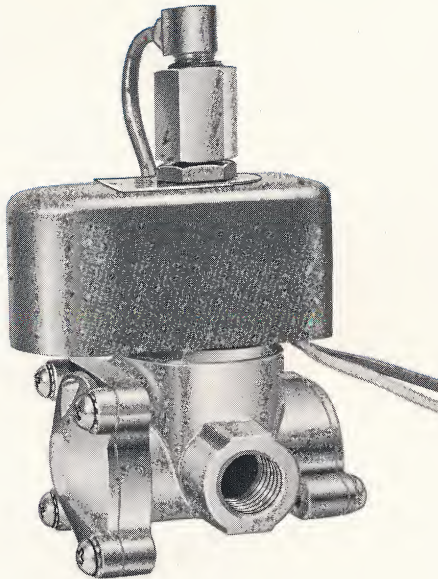
Types V53, V54, V55, V56



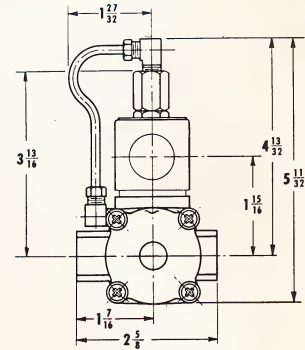
Type Q53

The most versatile line of three-way valves available, with thousands of mounting, porting and flow control options. Three-way general purpose valves are available normally open, Type V55; normally closed, Types V53, V53A; directional control, Type V56, and multipurpose, Type V54. Three-way special purpose normally closed, Types Q53, Q53A, are also available for exhausting cylinders 4 times as fast as conventional three-way valves.

THREE-WAY HIGH FLOW ELECTRIC VALVES, L SERIES

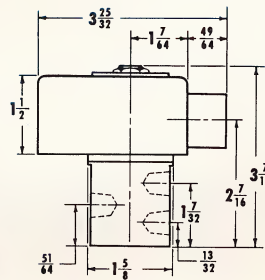


Type LP3 3/8"



Three-way L Series valves are quality heavy-duty models that have high flow capacity. The valves are pilot-operated and have a forged naval brass body with stainless steel and brass internal parts. Available three-way normally open, Type LP5; normally closed, Type LP3, and directional control, Type L6.

TWO- AND THREE-WAY SPECIAL PURPOSE HIGH PRESSURE HYDRAULIC ELECTRIC VALVES, TYPE V10



Type V10

Two- and three-way stainless steel spool type valves are designed for high pressure hydraulic applications. Available three-way normally open, normally closed, directional control, and multi-purpose, one port can be plugged to provide two-way normally open or normally closed operation.

HOW TO ORDER SKINNER VALVES WITH MAGNELATCHTM OPTION

Note: Refer to the current Skinner Catalog for complete specifications and listings of the various valve series listed above.

To order a valve with the Magnelatch option, specify:

Valve Catalog Number—as listed in the Catalog

Voltage

Media to be controlled

Option desired—Magnelatch

Example:

V52 DA2 125; 115v 60cy air service; Magnelatch option

A different valve number will be assigned to indicate the option.

Consult Skinner for availability of battery pack.

SKINNER ELECTRIC VALVES

SKINNER ELECTRIC VALVE DIVISION • SKINNER PRECISION INDUSTRIES, INC. • NEW BRITAIN, CONNECTICUT, U.S.A.

FIRST CLASS
PERMIT NO. 243
NEW BRITAIN,
CONN.

BUSINESS REPLY MAIL

NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

POSTAGE WILL BE PAID BY

SKINNER ELECTRIC VALVE DIVISION

SKINNER PRECISION INDUSTRIES, INC.

95 Edgewood Avenue

New Britain, Connecticut 06050



I require more detailed information on
Skinner Electric Valves.

- ☐ Send detailed catalog
- ☐ Have Field Representative call
- ☐ Other:

Name.....

Title or Dept.....

Company.....

Address.....

City.....State.....Zip.....

We make.....

.....

.....

PRICE SHEET FOR SKINNER MAGNELATCH® OPTION

TERMS — Net 30 Days
F.O.B. New Britain, Connecticut, U.S.A.
Minimum Invoice \$10.00 Net

Effective November 1, 1965

MAGNELATCH® OPTION IS USED ON SKINNER VALVE SERIES L, R, Q5, V5, AND V10

ALL PRICES INCLUDE CLASS A MOLDED WATERPROOF COILS

Add List Price Extra to List Price of Catalog Valve with Grommet Housing

<u>Voltage</u>	<u>List Price Extra:</u>	
	<u>Grommet Housing</u>	<u>½" NPT Conduit Housing</u>
24 Volt 60 Cycle	\$ 15.00	\$ 15.50
115 Volt 60 Cycle	14.50	15.00
230 Volt 60 Cycle	15.00	15.50
6 Volt DC	14.00	14.50
12 Volt DC	14.00	14.50
24 Volt DC	14.00	14.50
22-½ Volt DC (For Battery Pack Circuit)	13.00	13.50

Battery Pack — \$13.50 Each Net

Battery Pack requires one 22-½ Volt DC Battery which is not included. Use Standard ASA Type F20 (NEDA 210) Battery.

Suggested Batteries are: Burgess U15 RCA VS084
 Ray-O-Vac 215 Eveready 412



THE CREST OF QUALITY

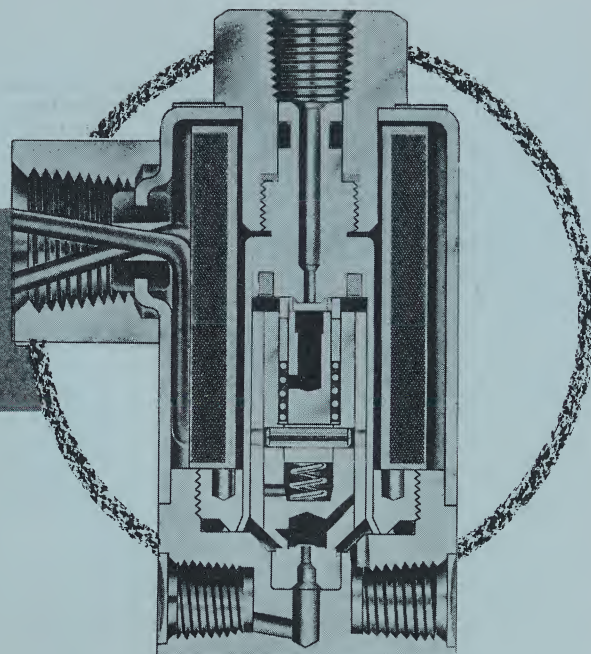
SKINNER MAGNELATCH VALVES

SKINNER ELECTRIC VALVE DIVISION
SKINNER PRECISION INDUSTRIES, INC. • NEW BRITAIN, CONNECTICUT, U.S.A.

C2.2.6
ISSUED 10-65
REV. 6-66

SOLENOID VALVES

SKINNER



SKINNER ELECTRIC VALVE DIVISION

SKINNER PRECISION INDUSTRIES, INC.
NEW BRITAIN, CONNECTICUT, U. S. A.

NATIONWIDE STOCK LIST

The following Valve Numbers represent the most universally applied models in the Skinner Solenoid Valve line. To meet your emergency requirements, every Skinner Stocking Distributor in the U. S. carries a supply of every valve listed. In addition, Skinner distributors stock many other models which are popular in their localized areas.

(REFER TO SKINNER GENERAL CATALOG FOR COMPLETE DIMENSIONS AND SPECIFICATIONS.)

CATALOG NUMBER	MAXIMUM OPERATING PRESSURE DIFFERENTIAL PSI	ORIFICE DIAMETER INCHES		PIPE SIZE INCHES	LIST PRICE
		NORMALLY CLOSED	NORMALLY OPEN		

TWO-WAY NORMALLY CLOSED VALVES

B2 DA9 175	175	1/16	—	1/16 PTF	\$ 9.00
C2 DB1 132	130	3/64	—	1/8 NPTF	8.00
V52H DB2 1502	1500	3/64	—	1/4 NPT	16.25
V52 DB2 125	125	3/32	—	1/4 NPT	10.50
V52 DB2 100	100	1/8	—	1/4 NPT	10.50
X52 DB2 100	Explosion-proof version of above			—	16.25
V52 DB2 052	50	3/16	—	1/4 NPT	10.50
V52 DB2 022	20	1/4	—	1/4 NPT	10.50
R2 DB2 200	5-200	1/4	—	1/4 NPT	15.75
LC2 DB4 150	5-150	1/2	—	1/2 NPT	17.75
L2 DB5 150	5-150	3/4	—	3/4 NPT	24.25
L2 DB6 150	5-150	1	—	1 NPT	28.25

TWO-WAY NORMALLY OPEN VALVES

RP1 DB2 150	5-150	—	1/4	1/4 NPT	20.75
V51 DB2 125	125	—	3/32	1/4 NPT	12.75
LP1 DB4 150	5-150	—	1/2	1/2 NPT	25.75

THREE-WAY HIGH PRESSURE, HYDRAULIC VALVES—DUAL PURPOSE

V18 DB1 1002	1000	3/32	3/32	1/8 NPT	31.50
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CATALOG NUMBER	MAXIMUM OPERATING PRESSURE DIFFERENTIAL PSI	ORIFICE DIAMETER INCHES		PIPE SIZE INCHES	LIST PRICE
		NORMALLY CLOSED	NORMALLY OPEN		

THREE-WAY NORMALLY CLOSED VALVES

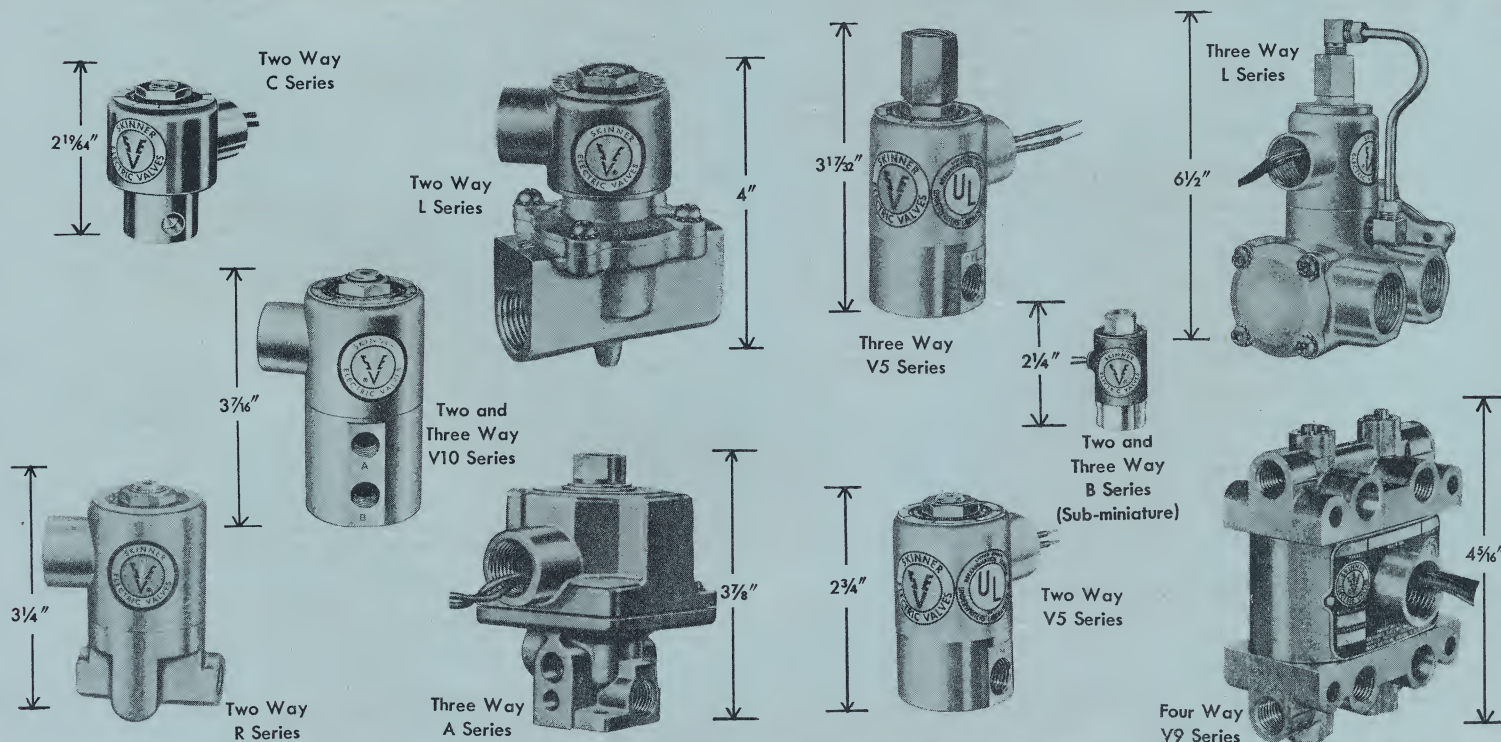
B3 DA9 150	150	3/4	3/4	1/16 PTF	\$12.50
V53 DB2 150	150	3/4	1/16	1/4 NPT	13.50
V53 DB2 100	100	1/16	1/16	1/4 NPT	13.50
X53 DB2 100	Explosion-proof version of above			—	19.25
†V53A DB2 100	100	1/16	1/16	1/4 NPT	12.75
†X53A DB2 100	Explosion-proof version of above			—	18.50
†Q53A DB2 100	Quick exhaust version			—	18.25
	of V53A DB2 100			3/32 & 1/8	
†Air service only.					
V53 DB2 050	50	1/8	3/32	1/4 NPT	13.50
A3 DB2 127	125	3/32	3/32	1/4 NPTF	19.00
LP3 DB3 150	10-150	3/8	3/8	3/8 NPT	37.75
LP3 DB4 150	10-150	1/2	1/2	1/2 NPT	42.00
LP3 DB5 150	5-150	3/4	3/4	3/4 NPT	56.75

THREE-WAY NORMALLY OPEN VALVES

A5 DB2 127	125	5/32	5/32	1/4 NPTF	21.00
V55 DB2 100	100	1/8	1/6	1/4 NPT	13.50
LP5 DB4 150	10-150	1/2	1/2	1/2 NPT	42.00
LP5 DB5 150	5-150	3/4	3/4	3/4 NPT	56.75

FOUR-WAY VALVES—NORMALLY CLOSED-NORMALLY OPEN

V935 DEH2 100	100	1/16 NC 1/8 NC	3/32 NO 1/16 NO	1/4 NPT	28.75
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ALABAMA**Birmingham**

ACTIVATION, INC.
P.O. Box 3990
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Phone: 787-9661

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AIR-DRAULICS COMPANY
P.O. Box 11689
3135 N. 29th Avenue
Phone: 254-8414

Tucson

AIR-DRAULICS COMPANY
2106 E. 17th Street
Phone: 624-7604

ARKANSAS**Little Rock**

JACK TYLER ENGINEERING CO.
P.O. Box 7042
1604 East 9th Street
Phone: 376-3623

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100 E. Graham Place
Phone: 843-4000

Montebello

METROPOLITAN SUPPLY COMPANY
1153 So. Greenwood Avenue
Phone: 723-9321

San Diego

HASKEL ENGINEERING & SUPPLY CO.
2145 San Diego Avenue
Phone: 297-4384

San Francisco

CALIFORNIA INSTRUMENT COMPANY
351 Tenth Street
Phone: 863-0350

HASKEL ENGINEERING & SUPPLY CO.
1228 Folsom Street
Phone: 863-1489

COLORADO**Denver**

AUTOMATIC CONTROL & EQUIPMENT CO.
5750 Pecos Street
Phone: 433-6436
HASKEL ENGINEERING & SUPPLY CO.
2262 S. Broadway
Phone: 744-6456

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KNOX, INC. OF CONNECTICUT
333 North Avenue
Phone: 368-3421

Hartford

SILLITER-HOLDEN, INC.
433 New Park Avenue
Phone: 232-4433

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AIR & HYDRAULIC ENGINEERING CO.
Div. of Faxon Engineering Co., Inc.
96A Howe Street
Phone: 562-9931

FLORIDA**Hialeah**

AIR EQUIPMENT COMPANY
854 West 20th Street
Phone: 887-9487

Jacksonville

CIRCUIT ENGINEERING, INC.
8421 Atlantic Boulevard
Phone: 721-1414

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SOUTHERN PUMP & SUPPLY, INC.
P.O. Box 1223
Corner Washington & Meridian
Phone: 229-0251

GEORGIA**Atlanta**

JAY INSTRUMENT & SPECIALTY CO.
532 Armour Circle, N.E.
Phone: 873-6137

LIVINGSTON & HAVEN, INC.
2164 Faulkner Road, N.E.
Phone: 636-0338

ILLINOIS**Broadview**

CATCHING ENGINEERING COMPANY
1919 West 19th Street
Phone: 344-2334

Chicago

AIR CONTROL, INC.
1100 W. Washington Blvd.
Phone: 421-4055

FLOW PRODUCTS, INC.
2626 West Addison Street
Phone: 528-2000

NORMAN ENGINEERING COMPANY
2115 W. Marquette Road
Phone: 434-2300

Rockford

NORMAN ENGINEERING COMPANY
1417 Eleventh Street
Phone: 965-5765

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TEC-HACKETT ENGINEERING, INC.
P.O. Box 57
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Phone: 742-8261

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Phone: 639-6494

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17 West 17th Street
Phone: 923-8538

South Bend

TEC-HACKETT ENGINEERING, INC.
1302 Mishawaka Avenue
Phone: 289-6977

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NORMAN ENGINEERING COMPANY
P.O. Box 694
Highway 67 at Devils Glen Road
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Foxhill Drive
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West Springfield

KNOX, INC.
528 Main Street
Phone: 788-9691

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20430 Sherwood Avenue
Phone: 366-8134

Fenton

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Phone: 629-2248

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1655 Steele Street, S.W.
Phone: 452-3251

Saginaw

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P.O. Box 2023
Corner Janes & Outer Drive
Phone: 754-2431

MINNESOTA**Minneapolis**

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J. E. BRAAS CO.
2948 Thirty-Sixth Avenue, So.
Phone: 729-2317

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Phone: 753-6333

St. Ann

DURKIN EQUIPMENT COMPANY
3010 N. Lindberg Boulevard
Phone: 739-0100

St. Louis

JOHN HENRY FOSTER COMPANY
2850 Gravois Avenue
Phone: 773-6408

NEBRASKA**Omaha**

BRAND HYDRAULICS
1010 No. 16th Street
Phone: 344-4434

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THE AIROYAL COMPANY
1990 Springfield Avenue
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P.O. Box 300
Phone: 539-4410

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Phone: 344-5911

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TRI-STATE SUPPLY COMPANY OF N.Y.
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Phone: 452-1231

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76 Pearl Street
Phone: 856-1110

Elmira

R. C. NEAL COMPANY, INC.
P.O. Box 526
Phone: 734-5168

Mount Vernon

NIELSEN HYDRAULIC EQUIPMENT, INC.
550 South Columbus Avenue
Phone: 668-3800

New York City

MONOGRAM PRODUCTS CO.
401 Broadway
Phone: 966-4080

Rochester

GENESEE AIR-HYDRAULIC SALES, INC.
1732 Hudson Avenue
Phone: 266-0422

R. C. NEAL COMPANY, INC.
P.O. Box 1750
572 Lyell Avenue
Phone: 254-0220

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AUTOMATION-SALES ENGINEERING CO.
P.O. Box 1020
426 Liberty Street
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119 Crescent Avenue
Phone: 475-9911

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4147 North High Street
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SCOTT EQUIPMENT COMPANY
272 Leo Street
Phone: 223-8141

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18614 Detroit Avenue
Phone: 221-4820

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MIDWEST FLUID POWER COMPANY
4325 Harris Street
Phone: 479-2271

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JOHN G. BURKE & COMPANY
P.O. Box 1652
3209 W. 21st Street
Phone: 583-9161

OREGON**Eugene**

COMPONENT PARTS CO.
P.O. Box 3193
150 Highway 99 North
Phone: 342-5583

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HYDRAULIC & AIR EQUIPMENT CO.
1234 Court Street
Phone: 779-3911

POWER TRANSMISSION PRODUCTS
1209 Court Street
Phone: 773-4633

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HYDRAULIC & AIR EQUIPMENT CO.
P.O. Box 10183
1925 N. W. Quimby
Phone: 222-3295

POWER TRANSMISSION PRODUCTS
1107 N. W. 14th Avenue
Phone: 227-1271

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ERIE INDUSTRIAL SUPPLY COMPANY
P.O. Box 6004
1616 West 8th Street
Phone: 452-3231

Greenville

ERIE INDUSTRIAL SUPPLY CO.
P.O. Box 272
87 Ohl Street
Phone: 588-8650

Philadelphia

AIRLINE EQUIPMENT COMPANY, INC.
333 East Hunting Park Avenue
Phone: 426-5820

Pittsburgh

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Phone: 321-8538

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JOHN C. WHIDDETT COMPANY
7714 West Chester Pike
Phone: 528-6400

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Phone: 421-8300

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Phone: 744-3334

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1308 East 23rd Street
Phone: 629-7353

Kingsport

ABERNATHY-THOMAS ENGINEERING CO.
535-537 E. Sullivan Street
Phone: 245-6151

Memphis

FLUID POWER OF MEMPHIS
2248 Dunn Road
Phone: 743-1122

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AIR-DRECO, INC.
P.O. Box 35652
2712 W. Mockingbird Lane
Phone: 657-3981

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AIR-DRECO, INC.
P.O. Box 22387
3200 Marquart at West Alabama
Phone: 666-2811

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LINCO, INC.
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2121 West Florida
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THE RAINS COMPANY
756 South 1st West
Phone: 355-1768

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VIRGINIA-CAROLINA CONTROLS CO.
108 So. Foushee Street
Phone: 644-0361

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HASKEL ENGINEERING & SUPPLY CO.
202 South Brandon Street
Phone: 725-4944

HYDRAULIC & AIR EQUIPMENT CO.
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Phone: 682-1681

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Phone: 744-9406

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Phone: 232-6006

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10548 109th Street
Phone: 429-1142

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CANTECH CONTROLS LTD.
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Phone: 876-0533

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865 Wall Street
Phone: 786-5808

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